1988 3003

SUBJECT : AUTOPSY OF PRESIDENT KENNEDY

TO : Brigadier General J. M. BLUMBERG, MC, USA

FROM : Lieutenant Colonel P. A. FINCK, MC, USA

Autopsy



BULLET SIMILAR TO PROJECTILE STRIKING PRESIDENT KENNEDY

obtained from the Federal Bureau of Investigation

by Lt. Colonel Pierre A. FINCK, MC, USA.



Full-patch copper-jacketed bullet.

Caliber 6.5-millimeter Mannlicher-Carcano.

Weight : approximately 160 grains (10 grams).

Muzzle velocity : approximately 2100 feet per second (640 meters per second).

Muzzle energy : approximately 1600 foot-pounds (220 kilogram-meters).

Manufacturer : Western Cartridge Company, USA.

COPY

CERTIFIED TRUE COPY FROM
OTIS HISTORICAL ARCHIVES
NATIONAL MUSEUM OF HEALTH AND MEDICINE
ARMED FORCES INSTITUTE OF PATHOLOGY

BY M V Steele, ARCHIVIST
BLUMBERG COLL.

Autopsy of

President Kennedy

1 February 1965

SUBJECT : Personal notes on the Assassination of President Kennedy.

TO : Brig. Gen. J. M. Blumberg, MC, USA
The Director
Armed Forces Institute of Pathology
Washington, DC 20305

1. In compliance with your request, attached are Subject notes.

2. Before the " Warren Report " was published, in September 1964, I received Directives by telephone, from the White House, through your Office and through the Naval Medical School in Bethesda, not to discuss Subject autopsy beyond the contents of the Warren Report.

3. I wish to take this opportunity to thank you for the confidence you have shown in my behalf by giving my name to Cdr. Humes, appointing me as representative of your Institute in the autopsy of President Kennedy.

Pierre Finck

Lt. Colonel Pierre A. FINCK, MC, USA
Chief, Military Environmental Pathology Division &
Chief, Wound Ballistics Pathology Branch
Armed Forces Institute of Pathology
Washington, DC 20305

THE AUTOPSY OF PRESIDENT KENNEDY

by Lt. Colonel Pierre A. FINCK, MC, USA.

Commander Humes, MC, USN, Director of Laboratories, Naval Medical School, National Naval Medical Center, Bethesda, Maryland, called me at home by telephone on 22 Nov 1963, 2000 hours. He told me to go immediately to the Naval Hospital. Brigadier General Blumberg, MC, USA, Director of the Armed Forces Institute of Pathology, Washington, D. C., had given my name.

I arrived at the Naval Hospital at 2030 hours. I saw a helicopter on the ground. A seaman escorted me to the autopsy room, guarded outside by military personnel and inside by Agents of the U. S. Secret Service. Rear Admiral Galloway, Commanding the Naval Center, Cdr Humes and Cdr Boswell, MC, USN, Chief of Pathology, showed me the wounds in the President's head. The brain, the heart and the lungs had been removed before my arrival. X ray films of the head and chest had been taken.
Also present in the autopsy room were : Rear Admiral Kenney, Surgeon General of the Navy; Rear Admiral Burkley, White House Physician; one Army Major General; a Brigadier General, Air Force Aid to the President; Capt Stover, MC, USN, Commanding the Naval Medical School; Capt Osborne, MC, USN, Chief of Surgery; Cdr Ebersole, MC, USN, a radiologist; a Navy photographer; Navy officers and enlisted men; Agents of the U. S. Secret Service and Federal Bureau of Investigation (FBI).

The Autopsy number assigned ~~kk~~ to the President by the Naval Hospital was : A - 63 - 272.

THE WOUNDS

The scalp of the vertex is lacerated. There is an open comminuted fracture of the cranial vault, many portions of which are missing.
The autopsy had been in progress for thirty minutes when I arrived.
Cdr Humes told me that he only had to prolong the lacerations of the scalp before removing the brain. No sawing of the skull was necessary.
The opening of the large head wound, in the right fronto-parieto-occipital region, is 130 millimeters (mm) in diameter.

I also noticed another scalp wound, possibly of entrance, in the right occipital region, lacerated and transversal, 15 x 6 mm. Corresponding to that wound, the skull shows a portion of a crater, the beveling of which is obvious on the internal aspect of the bone; on that basis, I told the prosectors and Admiral Galloway that this occipital wound is a wound of ENTRANCE. No EXIT wound is identifiable at this time in the skull, but close to midnight, portions of cranial vault are received from DALLAS, Texas. X ray films of these bone specimens reveal numerous metallic fragments. Two of the bone specimens, 50 mm in diameter, reveal BEVELING when viewed from the external aspect, thus indicating a wound of EXIT. Most probably, these bone specimens are part of the very large right skull wound, 130 mm in diameter and mentioned above. This right fronto-parieto-occipital wound is therefore an EXIT.

There is another wound, in the region of the right trapezius muscle, at 140 mm from the right acromion and at 140 mm from the tip of the right mastoid process (I took these measurements). The wound is OVAL, 7 x 4 mm, and shows well demarcated edges.

This wound cannot be probed with the soft probe available. There is subpleural hemorrhage in the right apical mesial region. The apex of the right lung is hemorrhagic, without laceration of the pleura.
On the basis that there is a wound possibly of entrance, which cannot be probed through the body, I SUGGEST X RAY FILMS BE TAKEN, ANTEROPOSTERIOR AND LATERAL, OF THE ENTIRE BODY, BEFORE GOING ANY FURTHER WITH THE AUTOPSY.
This radiologic survey does not reveal any major missile in the President's cadaver. There are only numerous metallic fragments in the head, in the sagittal ~~path~~ plane. Some of these are recovered and are turned over to FBI Agents against receipt. I help the Navy photographer to take photographs of the occipital wound (external and internal aspects) as well as of the wound in the back.

There is a recent TRACHEOTOMY wound (transversal incision) with moderate hemorrhage in the subcutaneous tissue. Thanks to a telephone call from Cdr Humes to Dallas, I found out later that the surgeons in Dallas had EXTENDED THE EXIT WOUND in the anterior aspect of the neck to make his tracheotomy. The tracheotomy wound was examined by the three prosectors. None of us noticed a bullet wound along its course. THE ORGANS OF THE NECK WERE NOT REMOVED : THE PRESIDENT's FAMILY INSISTED TO HAVE ONLY THE HEAD EXAMINED. Later, the permission was extended to the CHEST.

Three civilian embalmers from GAWLER FUNERAL HOME prepared the body for burial. It took four hours to clean, embalm and dress the body of the President. The cadaver left the Naval Hospital at 0400 hours, 23 November 1963, in a casket of African mahogany. The officers present saluted the casket, covered with a flag.

After the body was placed into a USN ambulance, to be brought to the White House, I saw Mrs Jacqueline Kennedy come out of the hospital and get into her car, protected by the Secret Service. She had the same pink dress she was wearing in Dallas at the time of the assassination.

On Sunday 24 November 1963, I went to the Naval Hospital to help Cdr Humes who had written an autopsy report. Humes, Boswell and Finck, the three prosectors, signed the Autopsy report in the Office of Admiral Galloway. (I had suggested several corrections in the autopsy report. [redacted] * While we were checking the autopsy report in the Admiral's office, the Television announced the murder of Oswald by Ruby).

In my discussion with Cdr Humes, I stated that we should not check the block " complete Autopsy " in the Autopsy Report Form. In compliance with the wishes of the Kennedy family, the prosectors had confined their examination to the head and chest. Humes declared that the block " complete Autopsy " should be checked.

Cdr Humes called me on 29 Nov 63 that the three prosectors would examine the brain at the Naval Hospital. I asked if a representative of the Neuropathology Branch of the Armed Forces Institute of Pathology would be invited to the gross examination of the brain. Humes told me that no additional persons would be admitted. Humes, Boswell and myself examined the formalin fixed brain. A US Navy photographer was present.

DESCRIPTION : The formalin fixed brain weighs 1500 grams. The arteries of the base show no arteriosclerotic plaques. The left hemisphere shows minimal frontal and parietal subarachnoid hemorrhage.

* Original reads: "Cdr Humes agreed."

There is a parasagittal laceration of the right cerebral hemisphere, extending from the frontal to the occipital lobes and exposing the Thalamus.
The Corpus Callosum is lacerated. No metallic fragments are identified but there are numerous small bone fragments, between one and ten millimeters in greatest dimension, in the container where the brain was fixed.
The CONVOLUTIONS of the brain are flat and the SULCI are narrow, but this is interpreted as a fixation artefact because the change was not observed at the time of autopsy.
COLOR AND BLACK AND WHITE PHOTOGRAPHS are taken by the US Navy photographer : superior and inferior aspects of the brain.
Cdr Humes takes SECTIONS from the subarachnoid hemorrhage of the left cerebral hemisphere and from the laceration of the right cerebral hemisphere but does not ~~xakx~~ make coronal sections in order to preserve the specimen.

On 13 Dec 1963, I had the opportunity to examine the weapon used to kill President Kennedy. I saw the 6.5 mm Carcano Italian Short Rifle in the Firearms Unit of the Federal Bureau of Investigation (FBI Laboratory).

The President's Commission on the

Assassination of President Kennedy

(" Warren Commission ")

Warren Comm.

THE WARREN COMMISSION

On 16 March 1964, I went to the Veterans of Foreign Wars (VFW) Building, 200 Maryland Avenue NE, Washington, DC, with Humes and Boswell, to appear before the Warren Commission. We reported at 1100 hours to Mr Arlen Specter, Attorney at Law from Philadelphia, who was Counsel to the Warren Commission appointed by President Johnson to investigate the assassination of Kennedy.

Mr Specter told us that the Attorney General, Robert Kennedy, brother of the assassinated President, did not make available to the Commission the X Ray films and the Photographs taken before and during the autopsy. I had seen the X ray films in the Autopsy room of the Bethesda Naval Hospital. The autopsy photographs, taken before and during the autopsy were turned over to the US Secret Service in the autopsy room and none of the prosectors ever saw the processed photographs.

Mr Specter showed us the CLOTHING worn by the President, the bullet recovered from the stretcher of Governor Connally and two fragments of bullets, all showing a copper jacket and all fired by Oswald's rifle. I also had the opportunity to see the ballistics report addressed by J Edgar HOOVER, FBI Director to the President of the Commission, dated 11 March 1964.

CLOTHING : There is a hole in the back ~~in~~ of the President's coat, a portion of which ~~xx~~ was removed by the FBI Laboratory for fibers study. The hole is approximately 15 cm below the upper ~~edge~~ edge of the collar to the right. Another hole is found immediately below the collar taken by the FBI Lab agents, for fiber control study.

~~The shirt~~ ~~xxxxxxxx~~ The shirt of the President, white with brown stripes, and a Park Avenue shirt shop label, showed abundant blood in the back and front. There is a bullet hole, in the back and to the right, at 15 cm from the upper edge of the collar.

Immediately below the upper button of the front is a bullet hole perforating both ~~fk~~ flaps of the shirt, right and left. There is dry blood on the margins of both holes. The innermost hole reveals fibers directed outward, which indicates an EXIT PERFORATION. The ~~xxxxx~~ outermost hole also shows this outward orientation of the ~~bloody~~ bloody shirt fibers, but to a lesser extent. These two anterior holes below the collar button correspond to the exit wound found by the Dallas surgeons at Parkland Hospital and which was extended for tracheotomy purposes. Dallas records show that the trachea had been lacerated by the bullet. WE DID NOT HAVE THIS INFORMATION AT THE TIME OF AUTOPSY.

The TIE worn by Kennedy, a blue silk tie labeled " Monsieur " Christian Dior, shows a tear of the cloth to the left side of the knot and corresponding to the two anterior holes in the shirt. The tie knot was not perforated but GLANCED by the bullet, which is indicated by the fact that the white padding of the tie is visible and that the blue cloth on the internal aspect of the knot is intact, which indicates a tangential path on the left side in relation to the knot.

BALLISTICS REPORT FROM FBI : Ammunition used by Oswald is 6.5-mm Mannlicher-Carcano copper jacketed bullet, made by Western Cartridge Co. Bullet weight : approximately 160 grains. Muzzle velocity approximately 2100 feet per second, kinetic energy approximately 1600 foot-pounds.

FBI Report on CLOTHING : Perforations of the shirt in the anterior portion below the collar button are typical for an EXIT WOUND.

My EXAMINATION OF THE MISSILES :

1. One copper jacketed bullet, consistent with 6.5 mm caliber. Approximate length : 30 mm. I was told not to touch these missiles beaause the FBI wanted to run more tests. The bullet shows rifle markings with twist to the right. The bullet is fully jacketed and kept its original shape : round nose and parallel edges. There is only one area of discoloration of the jacket on the nose, showing a questionably flattened area, possibly corresponding to impact with some hard surface.

2. One portion of distorted copper jacket, approximately 20 mm in diameter.

3. One portion of copper jacketed bullet, approximately 6.5 mm in diameter.

MEMBERS OF THE PRESIDENT's COMMISSION PRESENT IN THE ROOM

at the time of my testimony :

Chief Justice Earl Warren, age 72.

Allen Dulles, 70, former Director of the Central Intelligence Agency.

J.S. Cooper, 62, Republican senator from Kentucky.

G. Ford, 50, Republican ~~Repxxxxxx~~ Representative from Michigan.

J.J. McCloy, 68, one time US High Commissioner in West Germany.

MY TESTIMONY :

I was sworn in by Earl Warren, ~~President~~ Chairman of the Commission .

My testimony lasted for thirty minutes.

I testified that Kennedy was shot from behind.

One bullet entered the back at 14 cm from the right acromion and at 14 cm from the right mastoid process, produced ecchymosis of the dome of the parietal pleura on the right and came out in the anterior neck below the larynx without injuring bones. X ray films had ruled ~~thatxx~~ out bone injuries along the bullet path.

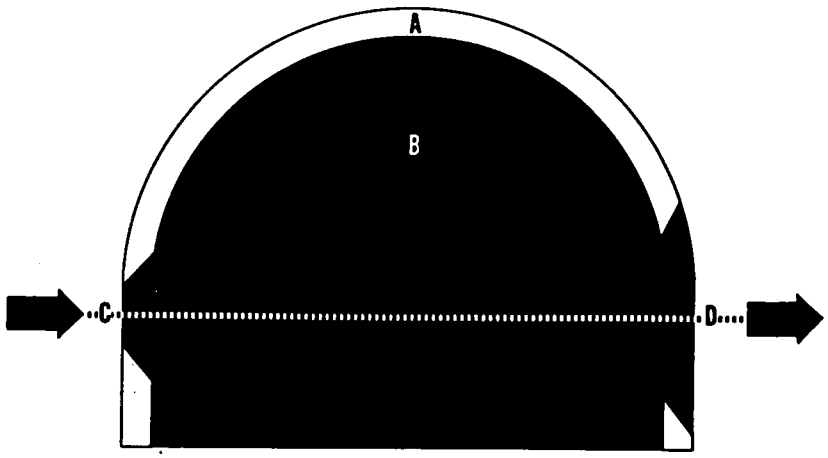
Another bullet struck Kennedy in the back of the head, at 25 mm to the right of the external occipital protuberance and slightly above. The bullet produced many fragments and an exit wound of ~~12x9~~ 130 mm in the right temporo-parieto-occipital bone. Many metallic fragments were seen on X ray films, but only ~~one was~~ two were recovered in the right frontal cerebral hemisphere, elongated and black, representing ~~at the most~~ approximately one tenth of the bullet mass. These fragments measured 7 X 2 and 3 X 1 mm.

I explained to the Commission on what basis I could identify ENTRY and EXIT wounds in the skull. I brought with me a scheme I had prepared before the Assassination of Kennedy. I had been working on this diagram for three years, on and off, bringing modifications and simplifications to it. This diagram applies to bones as well as to a pane of glass or panel of wood. My scheme was admitted by Chief Justice Warren as Exhibit 400 of the Commission. (A copy is attached).

I also testified that, in my opinion, the oval wound in the right posterior superior aspect of the chest of Kennedy was an ENTRY. The edges were fairly regular and there was black fouling of the edges.

10
B

PERFORATING MISSILE WOUND OF THE SKULL



A = Cranial vault. B = Cranial cavity. C = Entrance. D = Exit.

Arrows indicate missile path.
Entrance is often smaller than exit because of bullet "mushrooming" or tumbling and/or secondary missiles.
Note "coning," "cratering," or "beveling" of the bone.
The diameter of the hole is smaller on the impact side. (The same differences of diameter apply to a glass pane.)

(Scheme by Scientific Illustration Division, AFIP,
from data provided by Lt Col Pierre A. Finck, MC, USA. AFIP Neg. 63-4825.)

Scheme prepared before the assassination of Kennedy, for teaching purposes.

Admitted as Commission Exhibit No. 400, by Chief Justice Earl Warren, on 16 March 1964.

Reproduced in Volume XVII, page 50, of HEARINGS before the President's Commission on the Assassination of President Kennedy.

On 16 March 1964, I also had the opportunity to examine COLOR PRINTS, approximately 10 X 20 cm, stamped " US Secret Service, Washington, DC " on the back and made from the only satisfactory color film taken at the time of the Assassination of Kennedy. An amateur had taken for a few seconds the scene of the murder and sold it to LIFE MAGAZINE [redacted] * COLOR PRINTS, made from this 8 mm color motion picture, clearly show how Kennedy slumped forward from a sitting position in the Presidential car. The last frame does not show Kennedy, completely slumped forward but his wife, Jacqueline Kennedy, climbing on the trunk of the car (a Lincoln, made by the Ford Motor Company), seeking help for her husband. This sequence of photographs is compatible with a bullet hitting Kennedy in the back and with another bullet striking him in the head, both from behind.

On 16 March 1964, I had spent approximately seven hours with the WARREN COMMISSION.

* Original reads: "for $40,000.(?)"

On 23 March 1964, I learned from an FBI Agent that the Warren Commission had asked the FBI to keep all the Exhibits of the Commission, due to lack of storage facilities on the floor occupied by the Commission in the VFW Building. The agent told me that he was in possession of the drawings made in two days by a US Navy enlisted man at the National Naval Medical Center, before the testimony of the prosectors and showing the wounds of Kennedy. He also had Commission Exhibit 400, the scheme demonstrating a perforating missile wound of the skull, that I had submitted to the Commission.

All evidence and related material connected with Kennedy's Assassination and kept by the Firearms Unit of the FBI Laboratory occupied four cabinets, each 77 X 36 X 18 inches (195 X 91 X 45 centimeters).

On 14 April 1964, I appeared again before the Warren Commission for a hearing. I spent five hours at the Veterans of Foreign Wars Building, 200 Maryland Avenue, NE.

INDIVIDUALS PRESENT were : Mr Specter, Mr Rankin, Mr Eisenberg, Counsels of the Commission; FBI and Secret Service Agents; Cdrs Humes and Boswell; Drs F.W. Light and Olivier, from the US Army Arsenal, Edgewood, Md.

I saw a copy of the 8 millimeter ~~xxxxx~~ color motion picture film taken by an amateur and sold to LIFE magazine [redacted] * (·)

I saw the movie several times, at 18 frames per second and at slow motion. I also saw the 35 millimeter color lantern slides made from this movie, frame by frame. The movie and the slides show the President slumping forward after being hit in the back. Then it seems that Governor Connally has a spastic expression on his face, as he had been hit. His thigh is not visible and there is no evidence that blood appeared on his ~~xxxxxx~~ injured right wrist. THEN CAME THE SHOT THROUGH KENNEDY's HEAD.

I had the opportunity to examine the clothing of Governor Connally. The Governor was scheduled to come to Washington during April, we were told. The COAT showed one hole in the back, on the right, at mid-distance between the upper edge and the lower edge of the right shoulder seem, close to the seem, at approximately 20 centimeters from the upper edge of the collar. One hole in the right anterior portion, at approximately 30 cm from the collar. One hole in the anterior edge of the ~~x~~ right wrist.

The TROUSERS revealed one hole in the anterior portion of the knee.

The SHIRT disclosed dry brown discoloration, probably blood. We were told that the shirt was sent to a Texan Senator, and had been cleaned and pressed ~~xxxxx~~ before being submitted to the Investigators !Holes in back and front were larger than in coat. Some holes seemed to have been enlarged by scissors cuts.

* Original reads: "for $40,000."

The shirt of Texas Governor Connally also showed a hole in the right cuff.

(I did not have the opportunity to make exact measurements of these holes in the clothing of Connally. I wrote this description from memory, within two hours following my return from the Commission).

I also examined the REPLICA of the 6.5-mm Italian short rifle that killed Kennedy. Attached to the rifle was a Japanese optical device, magnifying four times and similar to the one used by Oswald.

The FBI made an excellent small scale reproduction of the buildings of Dallas, representing the scene of the assassination.

SUMMARY

by Lt. Col. Finck

SUMMARY

On the recommendation of Brigadier General Blumberg, Director of the Armed Forces Institute of Pathology and at the request of Commander Humes, MC, USN, Director of Laboratories, Naval Medical School, who called me at home by telephone, I went to the National Naval Medical Center, Bethesda, Maryland, where I arrived at approximately ~~2000~~ 2030 hours on 22 November 1963. The autopsy of President Kennedy was in progress. The radiologist had studied the radiographs of the head revealing numerous small metallic fragments.

I examined the wounds. The scalp of the back of the head showed a small laceration, 15 X 6 mm. Corresponding to this lesion, I found a through-and-through wound of the occipital bone, with a crater visible from the inside of the cranial cavity. This bone wound showed no crater when viewed from outside the skull. On the basis of this pattern of the occipital bone perforation, I stated that the wound in the back of the head was an entrance. Later in the evening, I examined three bone fragments sent from Dallas and corresponding to the large head wound approximately 130 mm. in diameter in the right side of the cranial vault. After identifying their anatomic external and internal surfaces, I noticed that the beveling of the fragments was apparent when viewed from outside. I stated then that these portions of bone were part of a wound of exit. Therefore, the large irregular wound in the right side of the cranial vault was a wound of exit.

The wound in the upper back of the President, to the right of the mid-line was oval and had a regular, soiled inverted margin. I stated that this was an entrance. My attempt to probe the path of the bullet was unsuccessful. I examined the tracheotomy skin wound and the trachea and did not find evidence of a bullet wound. Having a wound of entrance in the back and no corresponding exit, I requested a whole body radiographic survey, the results of which were negative. There was no bullet in the President's cadaver except the metallic fragments seen in the head. It was only after the autopsy that the prosectors learned, thanks to a telephone call of Cdr. Humes to Dallas, that the small wound of exit in the front of the neck had been extended by the Dallas surgeons at the time of their tracheotomy.

I testified before the Warren Commission on 16 March 1964. Chief Justice Warren swore me in. The Commission admitted as Exhibit 400 the schematic representation of a perforating missile wound of the skull that I had prepared for teaching purposes at the Armed Forces Institute of Pathology before the assassination.

When the "Warren Report" became public on 28 September 1964, I learned that independent experiments made without my knowledge at the U. S. Army Arsenal, Edgewood, Maryland with the 6.5-mm. rifle of Lee Harvey Oswald and ammunition similar to that of the assassination, had confirmed my opinion regarding the perforating wound of the head and the entrance wound of the back.

After the publication of the Warren Report, numerous physicians criticized the autopsy protocol that did not describe the adrenal glands of Kennedy who suffered from adrenal insufficiency. The prosectors complied with the autopsy permit and its restrictions. I was told that the Kennedy family first authorized the autopsy of the head only and then extended the permission to the chest. Organs of the neck were not removed, because of the same restrictions. I feel that the prosectors accomplished their MISSION that was to determine the direction of the shots and the cause of death. The head wound was definitely fatal. There were rumors - and even testimonies - that the President had been shot from behind and from the front. I established that Kennedy had two wounds of entrance in the back : one in the back of his head and one in his upper back at the base of the neck. After the completion of the post mortem examination, the Surgeon General of the Navy told us not to discuss the autopsy with anyone, even among prosectors or with the investigators involved.

I was denied the opportunity to examine the clothing of Kennedy. [redacted] *

I saw the clothing of Kennedy, for the first time, on 16 March 1964, at the Warren Commission, before my testimony, more than three months after the autopsy.

* Original reads: "One officer who out-ranked me told me that my request was only of academic interest. The same officer did not agree to state in the autopsy report that the autopsy was incomplete, as I had suggested to indicate."

I saw the x-ray films of the body but I never saw the photographs of the wounds that I had helped to take. They were turned over to the U. S. Secret Service. Agents of the Federal Bureau of Investigation took custody of the two metallic fragments recovered from the cerebral cortex.

Despite the incomplete or the inaccurate information we had at the time of the autopsy (for example, we were told that a bullet had been found on Kennedy's stretcher whereas it was on Connally's), the autopsy conclusions were verified by other examinations, such as gross, microscopic and spectrographic study of the clothing (FBI), and by independent experiments such as those conducted by scientists in Wound Ballistics at the U. S. Army Arsenal, Edgewood, Maryland.

More details are available in the Report of the President's Commission on the Assassination of President Kennedy (" Warren Report ") and in the 26 volumes of hearings and testimonies, all published by the U. S. Government Printing Office. See Mail Order Forms attached.

Pierre A. Finck

Lt. Colonel Pierre A. FINCK, MC, USA
04 043 322
Chief, Military Environmental Pathology Division and
Chief, Wound Ballistics Pathology Branch
ARMED FORCES INSTITUTE OF PATHOLOGY
Washington, D.C.

COMMENT:

From the viewpoint of wound ballistics, the assassination of President Kennedy illustrates the role of the tissue in the wounding power of a projectile.

The first bullet that struck Kennedy in the back at a distance of approximately 180 feet (55 meters) and came out in the anterior portion of his neck did not strike bone and did not disintegrate.

The second bullet that struck Kennedy in the back of the head at a distance of approximately 270 feet (82 meters) disintegrated into numerous metallic fragments.

The two bullets were within the same range of kinetic energy. The muzzle energy was approximately 1600 foot-pounds (220 kilogram-meters).

The first bullet produced small entrance and exit wounds. The second bullet made a small entry and a very large exit in the head.

The 6.5-millimeter Mannlicher-Carcano bullet made by the Western Cartridge Company is approximately 30 mm. in length and 160 grains (10 grams) in weight. It has a full copper-jacket, a round nose and parallel edges. It has great stability.

Pierre A. Finck

PIERRE A. FINCK
Lt Colonel, MC, USA
Chief, Wound Ballistics Pathology Branch
Armed Forces Institute of Pathology
Washington, D.C. 20305

U. S. Government Printing Office

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Letters of

Appreciation

ARMED FORCES INSTITUTE OF PATHOLOGY
WASHINGTON, D.C. 20305

JMB/bmk
ADDRESS REPLY TO THE DIRECTOR
ATTN: [illegible]

11 January 1965

SUBJECT: Letter of Appreciation

TO: Lt. Colonel Pierre A. Finck, MC

1. I have known for many months of the invaluable service that you rendered to the United States Government on the tragic night in which you served so well at the autopsy of the late President Kennedy. I am sure that no fact was left undone as regards the forensic aspects in this tragedy. With your full knowledge in the field of wound ballistics and medical legal science you have rendered a real service.

2. It is a pleasure for me to once again commend you personally for your role.

JOE M. BLUMBERG
Brigadier General, MC, USA
The Director

5 Incl
1. Cy of ltr from General Counsel, President's Com. on Assassination of President Kennedy
2. Cy of ltr from Sec'y of Defense
3. Cy of 1st Ind. Chief, PRNC
4. Cy of Ltr from Chief, BUMED
5. Ltr from CO, NNMC

Copies furnished:
Personnel
AFIP Historical File

NATIONAL NAVAL MEDICAL CENTER
BETHESDA 14, MARYLAND

IN REPLY REFER TO
NNMC-C-05-qn
1650
JAN 4 1963

From: Commanding Officer, National Naval Medical Center
To: LTCOL P. A. FINCK, USA
Via: The Director, Armed Forces Institute of Pathology, Walter Reed Army Medical Center, Washington, D. C., 20305

Subj: Letter of appreciation

Encl: (1) Copy of subject letter

1. It is with pleasure that I forward a copy of enclosure (1) with my added thanks and sincere appreciation of the difficult and delicate tasks cited.

C. B. GALLOWAY

WARREN REPORT

DEPARTMENT OF THE NAVY
BUREAU OF MEDICINE AND SURGERY
WASHINGTON, D.C. 20390

IN REPLY REFER TO
BUMED-3175-as
10 December 1964

From: Chief, Bureau of Medicine and Surgery
To: Commanding Officer, National Naval Medical Center, Bethesda, Maryland
Via: Commandant, Potomac River Naval Command, Washington Navy Yard, Washington, D. C.

Subj: Letter of appreciation

Encl: (1) Copy of J. Lee Rankin, General Counsel, President's Commission on the Assassination of President Kennedy, ltr dtd 13 Nov 1964
(2) Copy of Memorandum from the Secretary of Defense dtd 24 Nov 1964

1. Your Staff and you are congratulated on your excellent attitude and efficiency that has made such an impression on the Honorable J. Lee Rankin as to warrant his fine remarks. I would also like to take this opportunity to express my appreciation for those who participated in the work of the Commission on the assassination of President Kennedy.

2. A copy of enclosures (1) and (2) are being sent to the Bureau of Naval Personnel for inclusion in your official record.

E. C. KENNEY

Volume II

Code 26:11
1650(269)
9653
23 DEC 1964

FIRST ENDORSEMENT on Chief, BuMed ltr BUMED-3175-as of 10 Dec 64

From: Commandant, Potomac River Naval Command
To: Commanding Officer, National Naval Medical Center

Subj: Letter of appreciation

1. Delivered noting with pleasure the comments by the Honorable J. Lee Rankin on the outstanding assistance provided by the National Naval Medical Center to the Warren Commission in the preparation of the report on the assassination of the late President Kennedy.

2. A "Well Done" to all personnel who assisted the Warren Commission in the preparation of its report.

A. J. Hill

A. J. HILL

Copy to:
BUMED

WARREN REPORT

THE SECRETARY OF DEFENSE
WASHINGTON

NOV 24 1964

MEMORANDUM FOR The Secretary of the Army
The Secretary of the Navy
The Secretary of the Air Force
Commandant of the Marine Corps
Assistant Secretary of Defense (Administration)
Acting General Counsel

Attached hereto is a letter from the Honorable J. Lee Rankin, General Counsel of the President's Commission on the Assassination of President Kennedy. In that letter he generously expresses his and the Commission's appreciation for the cooperation of the many persons in the Department of Defense who participated in the work of the Commission.

To Mr. Rankin's commendation I add my own for the wholehearted support of the work of the Commission by all in Defense who were fortunate enough to be called upon to assist in this historic and critically important endeavor.

Robert S. McNamara

Attachment

Volume 11

WARREN REPORT

PRESIDENT'S COMMISSION
ON THE
ASSASSINATION OF PRESIDENT KENNEDY
200 Maryland Ave. N.E.
Washington, D.C. 20002
Telephone 543-1400

EARL WARREN,
Chairman
RICHARD B. RUSSELL
JOHN SHERMAN COOPER
HALE BOGGS
GERALD R. FORD
JOHN J. McCLOY
ALLEN W. DULLES

J. LEE RANKIN,
General Counsel

NOV 13 1964

The Honorable

The Secretary of Defense

My dear Mr. Secretary:

On behalf of the Commission and myself I wish to thank you for the assistance the Commission received from the Department of Defense in the investigation of the assassination of President John F. Kennedy.

In the work, because of the special skills that were possessed by persons in various sections or agencies of the Department, we freely ranged from the Air Force for transportation and historians to other areas for secretaries and clerical personnel, to NSA for help on cryptography problems, the Marine Corps and Army for marksmanship and wound ballistics assistance, the Naval Medical Center for autopsy records and the skill of medical experts, and many others too numerous to list in this manner. In every case, a mere request was sufficient to obtain full and unlimited cooperation and assistance. We even imposed upon the Department by obtaining numerous extensions with regard to stenographic and clerical help because of our inability to complete the investigation within the various time limits that we had set for ourselves and hoped to achieve.

We are especially grateful to you and all of your good people for bearing with us and being so generous in your help, all of which became so necessary to the success of our endeavors.

It would be greatly appreciated if you would convey the Commission's deep sense of gratitude to the Secretaries of the

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three services, the Commandant of the Marine Corps, and your own General Counsel and Director of Personnel.

With kindest personal regards, I remain

Sincerely,

J. Lee Rankin

J. Lee Rankin
General Counsel

WARREN REPORT

WARREN REPORT

Articles from the Press

Press
Volume II

WARREN REPORT

The Washington Post

2 June 1964

Report Due to Name Oswald Lone Killer

Associated Press

The Warren commission's report on President Kennedy's assassination is expected to substantiate the original FBI finding that Lee Harvey Oswald, acting alone, murdered Mr. Kennedy.

The commission has completed its basic work and set the end of the month as the target date for a report expected to detail the evidence that Oswald was the assassin and acted alone.

The commission plans to call several more witnesses, including Mr. Kennedy's widow, who will testify at a secret time and place.

The commission has heard some 400 witnesses, along with having examined thousands of investigative reports and at least 800 pieces of physical evidence. They are said to have overwhelmingly substantiated the FBI finding that put the finger on Oswald alone.

Volume II

HISTORICAL NOTES

A Compendium of Curious Coincidences

Wherever collectors of odd facts congregate these days, the conversation almost invariably turns to the uncanny parallels in the lives—and deaths—of Abraham Lincoln and John F. Kennedy. How ever it started, it has added up to a compendium of curious coincidences. Last week even the G.O.P. *Congressional Committee Newsletter*, with



OSWALD BOOTH

Two assassins, 15 letters each.

a circulation among 15,000 Republicans, joined in the game with its own list. There were no political motives, explained *Newsletter* Editor Edward Neff. "We just thought of them as interesting." Among the fascinating facts:

Lincoln was elected in 1860, Kennedy in 1960. Both were deeply involved in the civil rights struggle. The names of each contain seven letters. The wife of each President lost a son when she was First Lady. Both Presidents were shot on a Friday. Both were shot in the head, from behind, and in the presence of their wives. Both presidential assassins were shot to death before they could be brought to trial. The names John Wilkes Booth and Lee Harvey Oswald each contain 15 letters. Lincoln and Kennedy were succeeded by Southerners named Johnson. Tennessee's Andrew Johnson, who followed Lincoln, was born in 1808; Texan Lyndon Johnson was born in 1908.

As these coincidences have been circulated, the facts have been embellished more than a little to fit. Many of the lists have it that Booth was born in 1839 and Oswald in 1939. Booth, in fact, was born in 1838. Some accounts point out that Lee Oswald shot Kennedy from a warehouse and ran to a theater, while Booth shot Lincoln in a theater and ran to a warehouse. But Booth's refuge, where he was killed twelve days after shooting Lincoln, was in fact a tobacco-curing barn. Beyond this the twists have gotten ridiculous. It has been noted that Kennedy was shot while riding in a Lincoln made by Ford. Lincoln of course was shot in Ford's Theater. In the end there is one fillip that has caused some political eyebrows to swivel: Andrew Johnson, after he filled out the remainder of Lincoln's second term, was followed in the White House by a Republican whose last name began with G.

NOTE : 1964 Republican Presidential candidate was Senator Goldwater.

(Source : TIME Magazine 21 Aug 1964)

WARREN REPORT

Report on the Assassination of

President John F. Kennedy

Popularly referred to as the "Warren Report"

Volume II

REPORT OF

THE PRESIDENT'S COMMISSION ON THE

ASSASSINATION OF

President John F. Kennedy

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON, D.C.

Volume II

Volume II

U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON: 1964

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402
Price $2.50 Paper Covers; $3.25 Cloth Bound

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*Mr. Willens also acted as liaison between the Commission and the Department of Justice.

PRESIDENT'S COMMISSION
ON THE
ASSASSINATION OF PRESIDENT KENNEDY

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J. LEE RANKIN, General Counsel

September 24, 1964

The President
The White House
Washington, D. C.

Dear Mr. President:

Your Commission to investigate the assassination of President Kennedy on November 22, 1963, having completed its assignment in accordance with Executive Order No. 11130 of November 29, 1963, herewith submits its final report.

Respectfully,

Earl Warren, Chairman

Richard B. Russell

John Sherman Cooper

Hale Boggs

Gerald R. Ford

Allen W. Dulles

John J. McCloy

Volume II

to the exclusion of all other weapons. Similarly, firearms identification experts are able to compare the markings left upon the base of cartridge cases and thereby determine whether both cartridges were fired by the same weapon to the exclusion of all other weapons. According to Frazier, such an identification "is made on the presence of sufficient individual microscopic characteristics so that a very definite pattern is formed and visualized on the two surfaces." [140] Under some circumstances, as where the bullet or cartridge case is seriously mutilated, there are not sufficient individual characteristics to enable the expert to make a firm identification.[141]

After making independent examinations, both Frazier and Nicol positively identified the nearly whole bullet from the stretcher and the two larger bullet fragments found in the Presidential limousine as having been fired in the C2766 Mannlicher-Carcano rifle found in the Depository to the exclusion of all other weapons.[142] Each of the two bullet fragments had sufficient unmutilated area to provide the basis for an identification.[143] However, it was not possible to determine whether the two bullet fragments were from the same bullet or from two different bullets.[144] With regard to the other bullet fragments discovered in the limousine and in the course of treating President Kennedy and Governor Connally, however, expert examination could demonstrate only that the fragments were "similar in metallic composition" to each other, to the two larger fragments and to the nearly whole bullet.[145] After examination of the three cartridge cases found on the sixth floor of the Depository, Frazier and Nicol concluded that they had been fired in the C2766 Mannlicher-Carcano rifle to the exclusion of all other weapons.[146] Two other experts from the Federal Bureau of Investigation, who made independent examinations of the nearly whole bullet, bullet fragments and cartridge cases, reached the identical conclusions.[147]

THE BULLET WOUNDS

In considering the question of the source of the shots fired at President Kennedy and Governor Connally, the Commission has also evaluated the expert medical testimony of the doctors who observed the wounds during the emergency treatment at Parkland Hospital and during the autopsy at Bethesda Naval Hospital. It paid particular attention to any wound characteristics which would be of assistance in identifying a wound as the entrance or exit point of a missile. Additional information regarding the source and nature of the injuries was obtained by expert examination of the clothes worn by the two men, particularly those worn by President Kennedy, and from the results of special wound ballistics tests conducted at the Commission's request, using the C2766 Mannlicher-Carcano rifle with ammunition of the same type as that used and found on November 22, 1963.

The President's Head Wounds

The detailed autopsy of President Kennedy performed on the night of November 22 at the Bethesda Naval Hospital led the three examining pathologists to conclude that the smaller hole in the rear of the President's skull was the point of entry and that the large opening on the right side of his head was the wound of exit.[148] The smaller hole on the back of the President's head measured one-fourth of an inch by five-eighths of an inch (6 by 15 millimeters).[149] The dimensions of that wound were consistent with having been caused by a 6.5-millimeter bullet fired from behind and above which struck at a tangent or an angle causing a 15-millimeter cut. The cut reflected a larger dimension of entry than the bullet's diameter of 6.5 millimeters, since the missile, in effect, sliced along the skull for a fractional distance until it entered.[150] The dimension of 6 millimeters, somewhat smaller than the diameter of a 6.5-millimeter bullet, was caused by the elastic recoil of the skull which shrinks the size of an opening after a missile passes through it.[151]

Lt. Col. Pierre A. Finck, Chief of the Wound Ballistics Pathology Branch of the Armed Forces Institute of Pathology, who has had extensive experience with bullet wounds, illustrated the characteristics which led to his conclusions about the head wound by a chart prepared by him. This chart, based on Colonel Finck's studies of more than 400 cases, depicted the effect of a perforating missile wound on the human skull.[152] When a bullet enters the skull (cranial vault) at one point and exits at another, it causes a beveling or cratering effect where the diameter of the hole is smaller on the impact side than on the exit side. Based on his observations of that beveling effect on the President's skull, Colonel Finck testified: "President Kennedy was, in my opinion, shot from the rear. The bullet entered in the back of the head and went out on the right side of his skull * * * he was shot from above and behind."[153]

Comdr. James J. Humes, senior pathologist and director of laboratories at the Bethesda Naval Hospital, who acted as chief autopsy surgeon, concurred in Colonel Finck's analysis. He compared the beveling or coning effect to that caused by a BB shot which strikes a pane of glass, causing a round or oval defect on the side of the glass where the missile strikes and a belled-out or coned-out surface on the opposite side of the glass.[154] Referring to the bullet hole on the back of President Kennedy's head, Commander Humes testified: "The wound on the inner table, however, was larger and had what in the field of wound ballistics is described as a shelving or coning effect."[155] After studying the other hole in the President's skull, Commander Humes stated: "* * * we concluded that the large defect to the upper right side of the skull, in fact, would represent a wound of exit."[156] Those characteristics led Commander Humes and Comdr. J. Thornton Boswell, chief of pathology at Bethesda Naval Hospital, who assisted in the autopsy, to conclude that the bullet

penetrated the rear of the President's head and exited through a large wound on the right side of his head.[157]

Ballistics experiments (discussed more fully in app. X, pp. 585–586) showed that the rifle and bullets identified above were capable of producing the President's head wound. The Wound Ballistics Branch of the U.S. Army laboratories at Edgewood Arsenal, Md., conducted an extensive series of experiments to test the effect of Western Cartridge Co. 6.5-millimeter bullets, the type found on Governor Connally's stretcher and in the Presidential limousine, fired from the C2766 Mannlicher-Carcano rifle found in the Depository. The Edgewood Arsenal tests were performed under the immediate supervision of Alfred G. Olivier, a doctor who had spent 7 years in wounds ballistics research for the U.S. Army.[158]

One series of tests, performed on reconstructed inert human skulls, demonstrated that the President's head wound could have been caused by the rifle and bullets fired by the assassin from the sixth-floor window. The results of this series were illustrated by the findings on one skull which was struck at a point closely approximating the wound of entry on President Kennedy's head. That bullet blew out the right side of the reconstructed skull in a manner very similar to the head wound of the President.[159] As a result of these tests, Dr. Olivier concluded that a Western Cartridge Co. 6.5 bullet fired from the C2766 Mannlicher-Carcano rifle at a distance of 90 yards would make the same type of wound as that found on the President's head. Referring to the series of tests, Dr. Olivier testified:

> It disclosed that the type of head wounds that the President received could be done by this type of bullet. This surprised me very much, because this type of stable bullet I didn't think would cause a massive head wound, I thought it would go through making a small entrance and exit, but the bones of the skull are enough to deform the end of this bullet causing it to expend a lot of energy and blowing out the side of the skull or blowing out fragments of the skull.[160]

After examining the fragments of the bullet which struck the reconstructed skull, Dr. Olivier stated that—

> the recovered fragments were very similar to the ones recovered on the front seat and on the floor of the car.
>
> This, to me, indicates that those fragments did come from the bullet that wounded the President in the head.[161]

The President's Neck Wounds

During the autopsy at Bethesda Naval Hospital another bullet wound was observed near the base of the back of President Kennedy's neck slightly to the right of his spine which provides further enlightenment as to the source of the shots. The hole was located approxi-

mately 5½ inches (14 centimeters) from the tip of the right shoulder joint and approximately the same distance below the tip of the right mastoid process, the bony point immediately behind the ear.[162] The wound was approximately one-fourth by one-seventh of an inch (7 by 4 millimeters), had clean edges, was sharply delineated, and had margins similar in all respects to those of the entry wound in the skull.[163] Commanders Humes and Boswell agreed with Colonel Finck's testimony that this hole—

> * * * is a wound of entrance. * * * The basis for that conclusion is that this wound was relatively small with clean edges. It was not a jagged wound, and that is what we see in wound of entrance at a long range.[164]

The autopsy examination further disclosed that, after entering the President, the bullet passed between two large muscles, produced a contusion on the upper part of the pleural cavity (without penetrating that cavity), bruised the top portion of the right lung and ripped the windpipe (trachea) in its path through the President's neck.[165] The examining surgeons concluded that the wounds were caused by the bullet rather than the tracheotomy performed at Parkland Hospital. The nature of the bruises indicated that the President's heart and lungs were functioning when the bruises were caused, whereas there was very little circulation in the President's body when incisions on the President's chest were made to insert tubes during the tracheotomy.[166] No bone was struck by the bullet which passed through the President's body.[167] By projecting from a point of entry on the rear of the neck and proceeding at a slight downward angle through the bruised interior portions, the doctors concluded that the bullet exited from the front portion of the President's neck that had been cut away by the tracheotomy.[168]

Concluding that a bullet passed through the President's neck, the doctors at Bethesda Naval Hospital rejected a theory that the bullet lodged in the large muscles in the back of his neck and fell out through the point of entry when external heart massage was applied at Parkland Hospital. In the earlier stages of the autopsy, the surgeons were unable to find a path into any large muscle in the back of the neck. At that time they did not know that there had been a bullet hole in the front of the President's neck when he arrived at Parkland Hospital because the tracheotomy incision had completely eliminated that evidence.[169] While the autopsy was being performed, surgeons learned that a whole bullet had been found at Parkland Hospital on a stretcher which, at that time, was thought to be the stretcher occupied by the President. This led to speculation that the bullet might have penetrated a short distance into the back of the neck and then dropped out onto the stretcher as a result of the external heart massage.[170]

Further exploration during the autopsy disproved that theory. The surgeons determined that the bullet had passed between two large strap muscles and bruised them without leaving any channel, since the bullet

merely passed between them.[171] Commander Humes, who believed that a tracheotomy had been performed from his observations at the autopsy, talked by telephone with Dr. Perry early on the morning of November 23, and learned that his assumption was correct and that Dr. Perry had used the missile wound in the neck as the point to make the incision.[172] This confirmed the Bethesda surgeons' conclusion that the bullet had exited from the front part of the neck.

The findings of the doctors who conducted the autopsy were consistent with the observations of the doctors who treated the President at Parkland Hospital. Dr. Charles S. Carrico, a resident surgeon at Parkland, noted a small wound approximately one-fourth of an inch in diameter (5 to 8 millimeters) in the lower third of the neck below the Adam's apple.[173] Dr. Malcolm O. Perry, who performed the tracheotomy, described the wound as approximately one-fifth of an inch in diameter (5 millimeters) and exuding blood which partially hid edges that were "neither cleancut, that is, punched out, nor were they very ragged."[174] Dr. Carrico testified as follows:

> Q. Based on your observations on the neck wound alone did you have a sufficient basis to form an opinion as to whether it was an entrance or an exit wound?
>
> A. No, sir; we did not. Not having completely evaluated all the wounds, traced out the course of the bullets, this wound would have been compatible with either entrance or exit wound depending upon the size, the velocity, the tissue structure and so forth.[175]

The same response was made by Dr. Perry to a similar query:

> Q. Based on the appearance of the neck wound alone, could it have been either an entrance or an exit wound?
>
> A. It could have been either.[176]

Then each doctor was asked to take into account the other known facts, such as the autopsy findings, the approximate distance the bullet traveled and tested muzzle velocity of the assassination weapon. With these additional factors, the doctors commented on the wound on the front of the President's neck as follows:

> Dr. CARRICO. With those facts and the fact as I understand it no other bullet was found this would be, this was, I believe, was an exit wound.[177]
>
> Dr. PERRY. A full jacketed bullet without deformation passing through skin would leave a similar wound for an exit and entrance wound and with the facts which you have made available and with these assumptions, I believe that it was an exit wound.[178]

Other doctors at Parkland Hospital who observed the wound prior to the tracheotomy agreed with the observations of Drs. Perry and Carrico.[179] The bullet wound in the neck could be seen for only a short time, since Dr. Perry eliminated evidence of it when he performed

730-900 O-64—8

the tracheotomy. He selected that spot since it was the point where such an operation was customarily performed, and it was one of the safest and easiest spots from which to reach the trachea. In addition, there was possibly an underlying wound to the muscles in the neck, the carotid artery or the jugular vein, and Dr. Perry concluded that the incision, therefore, had to be low in order to maintain respiration.[180]

Considerable confusion has arisen because of comments attributed to Dr. Perry concerning the nature of the neck wound. Immediately after the assassination, many people reached erroneous conclusions about the source of the shots because of Dr. Perry's observations to the press. On the afternoon of November 22, a press conference was organized at Parkland Hospital by members of the White House press staff and a hospital administrator. Newsmen with microphones and cameras were crowded into a room to hear statements by Drs. Perry and William Kemp Clark, chief neurosurgeon at Parkland, who had attended to President Kennedy's head injury. Dr. Perry described the situation as "bedlam." [181] The confusion was compounded by the fact that some questions were only partially answered before other questions were asked.[182]

At the news conference, Dr. Perry answered a series of hypothetical questions and stated to the press that a variety of possibilities could account for the President's wounds. He stated that a single bullet could have caused the President's wounds by entering through the throat, striking the spine, and being deflected upward with the point of exit being through the head.[183] This would have accounted for the two wounds he observed, the hole in the front of the neck and the large opening in the skull. At that time, Dr. Perry did not know about either the wound on the back of the President's neck or the small bullet-hole wound in the back of the head. As described in chapter II, the President was lying on his back during his entire time at Parkland. The small hole in the head was also hidden from view by the large quantity of blood which covered the President's head. Dr. Perry said his answers at the press conference were intended to convey his theory about what could have happened, based on his limited knowledge at the time, rather than his professional opinion about what did happen.[184] Commenting on his answers at the press conference, Dr. Perry testified before the Commission:

> I expressed it [his answers] as a matter of speculation that this was conceivable. But, again, Dr. Clark [who also answered questions at the conference] and I emphasized that we had no way of knowing.[185]

Dr. Perry's recollection of his comments is corroborated by some of the news stories after the press conference. The New York Herald Tribune on November 23, 1963, reported as follows:

> Dr. Malcolm Perry, 34, attendant surgeon at Parkland Hospital who attended the President, said he saw two wounds—

one below the Adam's apple, the other at the back of the head. He said he did not know if two bullets were involved. It is possible, he said, that the neck wound was the entrance and the other the exit of the missile.[186]

According to this report, Dr. Perry stated merely that it was "possible" that the neck wound was a wound of entrance. This conforms with his testimony before the Commission, where he stated that by themselves the characteristics of the neck wound were consistent with being either a point of entry or exit.

Wound ballistics tests.—Experiments performed by the Army Wound Ballistics experts at Edgewood Arsenal, Md. (discussed in app. X, p. 582) showed that under simulated conditions entry and exit wounds are very similar in appearance. After reviewing the path of the bullet through the President's neck, as disclosed in the autopsy report, the experts simulated the neck by using comparable material with a thickness of approximately 5½ inches (13½ to 14½ centimeters), which was the distance traversed by the bullet. Animal skin was placed on each side, and Western Cartridge Co. 6.5 bullets were fired from the C2766 Mannlicher-Carcano rifle from a distance of 180 feet. The animal skin on the entry side showed holes which were regular and round. On the exit side two holes were only slightly elongated, indicating that the bullet had become only a little unstable at the point of exit.[187] A third exit hole was round, although not quite as regular as the entry holes.[188] The exit holes, especially the one most nearly round, appeared similar to the descriptions given by Drs. Perry and Carrico of the hole in the front of the President's neck.[189]

The autopsy disclosed that the bullet which entered the back of the President's neck hit no bony structure and proceeded in a slightly downward angle. The markings on the President's clothing indicate that the bullet moved in a slight right to left lateral direction as it passed through the President's body.[190] After the examining doctors expressed the thought that a bullet would have lost very little velocity in passing through the soft tissue of the neck, wound ballistics experts conducted tests to measure the exit velocity of the bullet.[191] The tests were the same as those used to create entry and exit holes, supplemented by the use of break-type screens which measured the velocity of bullets. The entrance velocity of the bullet fired from the rifle averaged 1,904 feet per second after it traveled 180 feet. The exit velocity averaged 1,772 to 1,798 feet per second, depending upon the substance through which the bullet passed. A photograph of the path of the bullet traveling through the simulated neck showed that it proceeded in a straight line and was stable.[192]

Examination of clothing.—The clothing worn by President Kennedy on November 22 had holes and tears which showed that a missile entered the back of his clothing in the vicinity of his lower neck and exited through the front of his shirt immediately behind his tie, nicking the knot of his tie in its forward flight.[193] Although the caliber of the bullet could not be determined and some of the clothing items

precluded a positive determination that some tears were made by a bullet, all the defects could have been caused by a 6.5-millimeter bullet entering the back of the President's lower neck and exiting in the area of the knot of his tie.[194]

An examination of the suit jacket worn by the President by FBI Agent Frazier revealed a roughly circular hole approximately one-fourth of an inch in diameter on the rear of the coat, 5⅜ inches below the top of the collar and 1¾ inches to the right of the center back seam of the coat.[195] The hole was visible on the upper rear of the coat slightly to the right of center. Traces of copper were found in the margins of the hole and the cloth fibers around the margins were pushed inward.[196] Those characteristics established that the hole was caused by an entering bullet.[197] Although the precise size of the bullet could not be determined from the hole, it was consistent with having been made by a 6.5-millimeter bullet.[198]

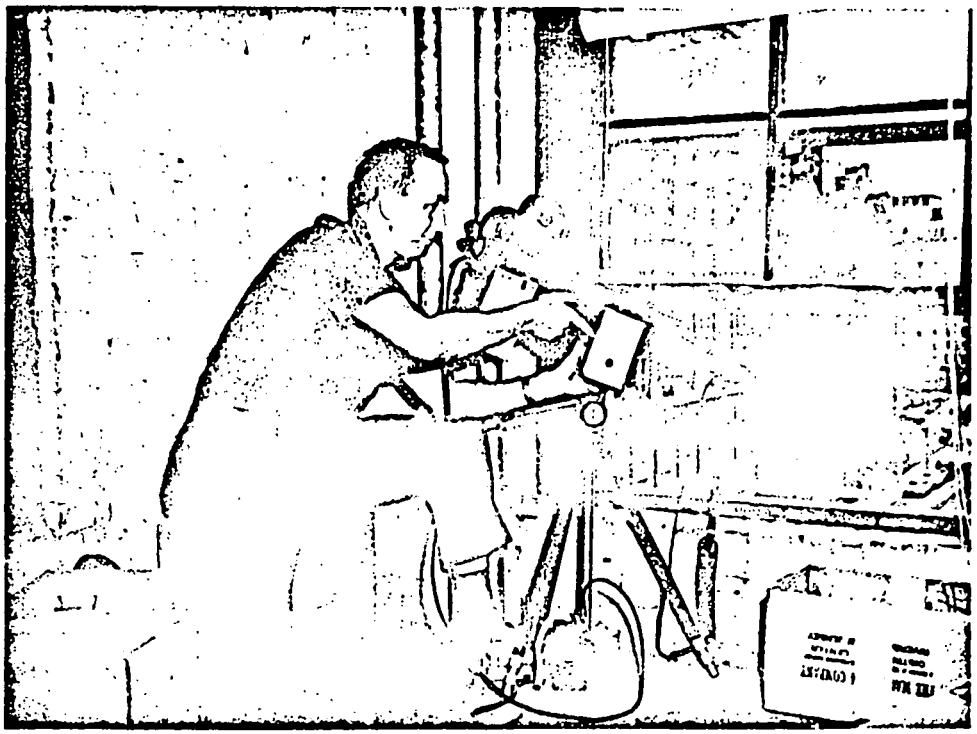
The shirt worn by the President contained a hole on the back side 5¾ inches below the top of the collar and 1⅛ inches to the right of the middle of the back of the shirt.[199] The hole on the rear of the shirt was approximately circular in shape and about one-fourth of an inch in diameter, with the fibers pressed inward.[200] These factors established it as a bullet entrance hole.[201] The relative position of the hole in the back of the suit jacket to the hole in the back of the shirt indicated that both were caused by the same penetrating missile.[202]

On the front of the shirt, examination revealed a hole seven-eighths of an inch below the collar button and a similar opening seven-eighths of an inch below the buttonhole. These two holes fell into alinement on overlapping positions when the shirt was buttoned.[203] Each hole was a vertical, ragged slit approximately one-half of an inch in height, with the cloth fibers protruding outward. Although the characteristics of the slit established that the missile had exited to the front, the irregular nature of the slit precluded a positive determination that it was a bullet hole.[204] However, the hole could have been caused by a round bullet although the characteristics were not sufficiently clear to enable the examining expert to render a conclusive opinion.[205]

When the President's clothing was removed at Parkland Hospital, his tie was cut off by severing the loop immediately to the wearer's left of the knot, leaving the knot in its original condition.[206] The tie had a nick on the left side of the knot.[207] The nick was elongated horizontally, indicating that the tear was made by some object moving horizontally, but the fibers were not affected in a manner which would shed light on the direction or the nature of the missile.[208]

The Governor's Wounds

While riding in the right jump seat of the Presidential limousine on November 22, Governor Connally sustained wounds of the back, chest, right wrist and left thigh. Because of the small size and clean-cut edges of the wound on the Governor's back, Dr. Robert Shaw concluded that it was an entry wound.[209] The bullet traversed the Gov-



COMMISSION EXHIBIT No. 887

Photograph taken during reenactment showing C2766 rifle with camera attached.

APPENDIX I

IMMEDIATE RELEASE NOVEMBER 30, 1963

Office of the White House Press Secretary

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THE WHITE HOUSE

EXECUTIVE ORDER
NO. 11130

- - - -

APPOINTING A COMMISSION TO REPORT UPON THE ASSASSINATION OF PRESIDENT JOHN F. KENNEDY

Pursuant to the authority vested in me as President of the United States, I hereby appoint a Commission to ascertain, evaluate and report upon the facts relating to the assassination of the late President John F. Kennedy and the subsequent violent death of the man charged with the assassination. The Commission shall consist of --

The Chief Justice of the United States, Chairman;

Senator Richard B. Russell;

Senator John Sherman Cooper;

Congressman Hale Boggs;

Congressman Gerald R. Ford;

The Honorable Allen W. Dulles;

The Honorable John J. McCloy.

The purposes of the Commission are to examine the evidence developed by the Federal Bureau of Investigation and any additional evidence that may hereafter come to light or be uncovered by federal or state authorities; to make such further investigation as the Commission finds desirable; to evaluate all the facts and circumstances surrounding such assassination, including the subsequent violent death of the man charged with the assassination, and to report to me its findings and conclusions.

The Commission is empowered to prescribe its own procedures and to employ such assistants as it deems necessary.

Necessary expenses of the Commission may be paid from the "Emergency Fund for the President".

All Executive departments and agencies are directed to furnish the Commission with such facilities, services and cooperation as it may request from time to time.

LYNDON B. JOHNSON

THE WHITE HOUSE,

November 29, 1963.

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Warren Report

123. 3 H 303 (Dr. Charles J. Carrico); 6 H 137 (Diann H. Bowron).
124. Id. at 137–138; 6 H 141 (Margaret M. Henchcliffe); 6 H 145 (Doris M. Nelson).
125. Id. at 145–146; 6 H 142 (Henchcliffe); 6 H 137–138 (Bowron).
126. 3 H 392–394 (Frazier); 4 H 260 (Day); CE 139.
127. 3 H 393–394 (Frazier); CE 541.
128. 3 H 392–393 (Frazier).
129. Id. at 392; CE 540.
130. 3 H 392–393 (Frazier).
131. 7 H 108–109 (Weitzman).
132. 3 H 395 (Frazier).
133. Ibid.
134. Id. at 395–396; 4 H 260 (Day).
135. 3 H 397 (Frazier).
136. Id. at 391.
137. Id. at 391, 421.
138. 3 H 496 (Joseph D. Nicol).
139. See generally 3 H 417–419, 429–430 (Frazier).
140. Id. at 424.
141. See app. X.
142. 3 H 429, 432, 435 (Frazier); 3 H 498, 500–502 (Nicol); CE 399, 567, 569.
143. 3 H 502 (Nicol); 3 H 434, 436 (Frazier).
144. 3 H 497 (Nicol); 3 H 435 (Frazier).
145. 5 H 73–74 (Frazier).
146. 3 H 415 (Frazier); 3 H 505 (Nicol); CE 543–545.
147. 3 H 440 (Frazier); 7 H 591 (Cortlandt Cunningham); 7 H 591 (Charles L. Killion).
148. 2 H 352–353 (Comdr. James J. Humes); 2 H 377 (Comdr. J. Thornton Boswell); 2 H 380 (Lt. Col. Pierre A. Finck).
149. 2 H 352 (Humes).
150. Id. at 357–359.
151. Id. at 359–361.
152. CE 400.
153. 2 H 379–380 (Finck).
154. 2 H 352 (Humes).
155. Ibid.
156. Ibid.
157. Ibid.; 2 H 377 (Boswell); CE 388.
158. 5 H 75–77 (Dr. Alfred G. Olivier).
159. Id. at 89; CE 861, 862.
160. 5 H 87 (Olivier).
161. Id. at 89.
162. 2 H 361 (Humes); CE 387, 391.
163. 2 H 364 (Humes); 2 H 380 (Finck).
164. Ibid.; 2 H 364 (Humes); 2 H 377 (Boswell).
165. 2 H 363 (Humes).
166. Id. at 367–368.
167. Id. at 364.
168. Ibid.; 2 H 380 (Finck); CE 385.
169. 2 H 368–369 (Humes).
170. Id. at 367.
171. Id. at 363.
172. Id. at 361–362.
173. 3 H 361 (Carrico).
174. 3 H 388 (Dr. Malcolm O. Perry); id. at 372.
175. 3 H 362 (Carrico).
176. 3 H 373 (Perry).
177. 3 H 362 (Carrico).
178. 3 H 373 (Perry).
179. 6 H 42–43 (Dr. Charles R. Baxter); 6 H 35 (Dr. Robert N. McClelland); 6 H 48–50 (Dr. Marion T. Jenkins); 6 H 55 (Dr. Ronald C. Jones).
180. 3 H 369 (Perry).
181. Id. at 375.
182. Id. at 375–376.
183. Id. at 375.
184. Id. at 368, 372, 375.
185. Id. at 375.
186. CE 1415, "The Doctors' Hard Fight To Save Him," New York Herald Tribune, Nov. 23, 1963.
187. 5 H 76–78 (Olivier).
188. Id. at 78; CE 850.
189. See 3 H 362 (Carrico); 3 H 368 (Perry).
190. 2 H 364 (Humes); CE 385; see 5 H 60–61 (Frazier); CE 394.
191. 2 H 375 (Humes).
192. 5 H 77–78 (Olivier); CE 849.
193. 5 H 59–62 (Frazier); CE 393, 394, 395.
194. 5 H 59–62 (Frazier).
195. Id. at 59.
196. Ibid.
197. Id. at 59–60.
198. Id. at 60.
199. Ibid.
200. Ibid.
201. Ibid.
202. Ibid.
203. Ibid.
204. Id. at 61.
205. Ibid.
206. CE 395.
207. 5 H 62 (Frazier).
208. Ibid.
209. 4 H 104 (Dr. Robert R. Shaw).
210. Id. at 104–105; CE 679, 680.
211. 4 H 104 (Shaw); 6 H 85 (Shaw).
212. 4 H 136–138 (Gov. John B. Connally, Jr.).
213. Id. at 135.
214. 4 H 118, 124 (Dr. Charles F. Gregory).
215. Id. at 118–119.
216. Id. at 119–120.
217. Id at 120–121.
218. Id at 124.
219. 6 H 89 (Shaw).
220. 4 H 109 (Shaw).
221. 4 H 138 (Connally); 6 H 106 (Dr. George T. Shires).
222. See 5 H 87 (Olivier); 6 H 106 (Shires).
223. Ibid.; 4 H 125 (Gregory).
224. 6 H 106, 109 (Shires); 4 H 113 (Shaw); 4 H 125 (Gregory).
225. CE 684; 5 H 63 (Frazier).
226. Ibid.
227. Ibid.; CE 683.
228. 5 H 64 (Frazier).
229. Id. at 63–64.
230. Id. at 64; CE 685.
231. 5 H 64 (Frazier).
232. Ibid.
233. Ibid.; CE 686.
234. 5 H 64–65 (Frazier).
235. Ibid.
236. Id. at 65.
237. Ibid.
238. CE 687, 688; 5 H 65–66 (Frazier).
239. Ibid.
240. 5 H 93 (Dr. Arthur J. Dziemian).
241. Ibid.
242. Ibid.; see 5 H 82–83 (Olivier).
243. Id. at 81.
244. Ibid.; CE 854, 855.
245. 5 H 82 (Olivier); CE 856.
246. 5 H 82 (Olivier).
247. Id. at 82–83.
248. Ibid.
249. 4 H 121–122 (Gregory).
250. See id. at 124.
251. See 5 H 82 (Olivier).
252. Id. at 87; see id. at 82.
253. 3 H 430 (Frazier).
254. 6 H 98 (Gregory).
255. Id. at 98–99.
256. 6 H 91 (Shaw); 6 H 101–102 (Gregory); 6 H 109–110 (Shires).
257. 4 H 139–140 (Connally).
258. Id. at 138–139; CE 689.
259. 5 H 92 (Dziemian); see 5 H 84–87 (Olivier); 5 H 95–97 (Dr. F. W. Light, Jr.).
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HEARINGS OF THE WARREN COMMISSION

(26 Volumes)

Volume II

Volume II

Testimony of Cdr Humes)
)
Cdr Boswell)
)
LtCol Finck)

Prosectors in the Autopsy
of
President Kennedy

Volume II

INVESTIGATION OF
THE ASSASSINATION OF PRESIDENT JOHN F. KENNEDY

HEARINGS

Before the President's Commission on the Assassination of President Kennedy

PURSUANT TO EXECUTIVE ORDER 11130, an Executive order creating a Commission to ascertain, evaluate, and report upon the facts relating to the assassination of the late President John F. Kennedy and the subsequent violent death of the man charged with the assassination and S.J. RES. 137, 88TH CONGRESS, a concurrent resolution conferring upon the Commission the power to administer oaths and affirmations, examine witnesses, receive evidence, and issue subpenas

Volume
II

UNITED STATES GOVERNMENT PRINTING OFFICE
WASHINGTON, D.C.

Preface

The testimony of the following witnesses is contained in volume II: James Herbert Martin, who acted for a brief period as the business manager of Mrs. Marina Oswald; Mark Lane, a New York attorney; William Robert Greer, who was driving the President's car at the time of the assassination; Roy H. Kellerman, a Secret Service agent who sat to the right of Greer; Clinton J. Hill, a Secret Service agent who was in the car behind the President's car; Rufus Wayne Youngblood, a Secret Service agent who rode in the car with then Vice President Johnson; Robert Hill Jackson, a newspaper photographer who rode in a car at the end of the motorcade; Arnold Louis Rowland, James Richard Worrell, Jr., and Amos Lee Euins, who were present at the assassination scene; Buell Wesley Frazier, who drove Lee Harvey Oswald home on the evening of November 21, and back to work on the morning of November 22; Linnie Mae Randle, Buell Wesley Frazier's sister; Cortlandt Cunningham, a firearms identification expert with the Federal Bureau of Investigation; William Wayne Whaley, a taxicab driver, and Cecil J. McWatters, a busdriver, who testified concerning Oswald's movements following the assassination; Mrs. Katherine Ford, Declan P. Ford, and Peter Paul Gregory, acquaintances of Lee Harvey Oswald and his wife; Comdr. James J. Humes, Comdr. J. Thornton Boswell, and Lt. Col. Pierre A. Finck, who performed the autopsy on the President at Bethesda Naval Hospital; and Michael R. Paine and Ruth Hyde Paine, acquaintances of Lee Harvey Oswald and his wife.

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Mr. GREGORY. No.

Mr. LIEBELER. Would it be fair to say, Mr. Gregory, that it was through Oswald's contact with you that he subsequently made the association with and contact with the other members of the Russian community in Dallas and Fort Worth?

Mr. GREGORY. I think that would be a fair statement, yes.

Mr. LIEBELER. I have no more questions.

The CHAIRMAN. Congressman?

Representative FORD. I have one more, Mr. Gregory.

I believe Marina has testified when she first met Lee Harvey Oswald it was approximately 17 months after he had arrived in the Soviet Union. She testified, also, that she could not tell whether he was a native born resident of the Soviet Union or a foreigner by the way he spoke.

Mr. GREGORY. Yes.

Representative FORD. Is that unusual?

Mr. GREGORY. Well, frankly, I don't know. You see, Congressman, the city of Minsk is what we call, they call it, not we call, they call it in the White Russia Republic. You know they called this the Union of Republics, you know, in the White Russian Republic, and Minsk, I guess, is the capital of it.

It is fairly close to Poland, and there are all sorts of people, Poles, Lithuanians, probably Latvians, that lived in that part of the country, and none of those people speak pure Russian.

Now, whether she had reference, whether that had anything to do with her statement——

Representative FORD. Her observations?

Mr. GREGORY. Right; I don't know.

Now, I thought that Lee Oswald spoke with a Polish accent, that is why I asked him if he was of Polish descent.

Representative FORD. But leaving——

Mr. GREGORY. But, otherwise, I would say it would be rather unusual, rather unusual for a person who lived in the Soviet Union for 17 months that he would speak so well that a native Russian would not be sure whether he was born in that country or not.

Representative FORD. That would be a very unusual kind of a person?

Mr. GREGORY. It would be, yes.

Representative FORD. Or a person who had unusual training?

Mr. GREGORY. Right, or unusual ability or training, yes, that is right.

Representative FORD. That is all, Mr. Chairman.

The CHAIRMAN. Thank you very much, Mr. Gregory. You have been very helpful.

(Whereupon, at 1 p.m., the President's Commission recessed.)

Monday, March 16, 1964

TESTIMONY OF COMDR. JAMES J. HUMES, COMDR. J. THORNTON BOSWELL, AND LT. COL. PIERRE A. FINCK

The President's Commission met at 2 p.m. on March 16, 1964, at 200 Maryland Avenue NE., Washington, D.C.

Present were Chief Justice Earl Warren, Chairman; Senator John Sherman Cooper, Representative Gerald R. Ford, John J. McCloy, and Allen W. Dulles, members.

Also present were J. Lee Rankin, general counsel; Francis W. H. Adams, assistant counsel; Norman Redlich, assistant counsel; Arlen Specter, assistant counsel; and Charles Murray, observer.

The CHAIRMAN. The Commission will be in order.

Commander Humes, will you please step up. You know, Commander, what we have met for today to take your testimony concerning the autopsy and anything else you might know concerning the assassination of the President.

Would you raise your right hand, please?

Do you solemnly swear the testimony you give before this Commission will be the truth, the whole truth and nothing but the truth, so help you God?

Commander HUMES. I do.

The CHAIRMAN. Will you be seated?

You may proceed.

Mr. SPECTER. Dr. Humes, will you state your full name for the record, please?

Commander HUMES. James Joseph Humes.

Mr. SPECTER. And what is your profession or occupation, please?

Commander HUMES. I am a physician and employed by the Medical Department of the United States Navy.

Mr. SPECTER. What is your rank in the Navy?

Commander HUMES. Commander, Medical Corps. United States Navy.

Mr. SPECTER. Where did you receive your education, Commander Humes, please.

Commander HUMES. I had my undergraduate training at St. Joseph's College at Villanova University in Philadelphia. I received my medical degree in 1948 from the Jefferson Medical College of Philadelphia.

I received my internship and my postgraduate training in my special field of interest in Pathology in various Naval hospitals, and at the Armed Forces Institute of Pathology at Walter Reed in Washington, D.C.

Mr. SPECTER. What do your current duties involve?

Commander HUMES. My current title is Director of Laboratories of the Naval Medical School at Naval Medical Center at Bethesda. I am charged with the responsibility of the overall supervision of all of the laboratory operations in the Naval medical center, two broad areas, one in the field of anatomic pathology which comprises examining surgical specimens and postmortem examinations and then the rather large field of clinical pathology which takes in examination of the blood and various body fluids.

Mr. SPECTER. Have you been certified by the American Board of Pathology?

Commander HUMES. Yes, sir; both in anatomic pathology and in clinical pathology in 1955.

Mr. SPECTER. What specific experience have you had, if any, with respect to gunshot wounds?

Commander HUMES. My type of practice, which fortunately has been in peacetime endeavor to a great extent, has been more extensive in the field of natural disease than violence. However, on several occasions in various places where I have been employed, I have had to deal with violent death, accidents, suicides, and so forth. Also I have had training at the Armed Forces Institute of Pathology, I have completed a course in forensic pathology there as part of my training in the overall field of pathology.

Mr. SPECTER. Did you have occasion to participate in the autopsy of the late John F. Kennedy on November 22, 1963?

Commander HUMES. Yes, sir; I did.

Mr. SPECTER. What was your specific function in connection with that autopsy?

Commander HUMES. As the senior pathologist assigned to the Naval Medical Center, I was called to the Center by my superiors and informed that the President's body would be brought to our laboratories for an examination, and I was charged with the responsibility of conducting and supervising this examination; told to also call upon anyone whom I wished as an assistant in this matter, that I deemed necessary to be present.

Mr. SPECTER. Who did assist you, if anyone, in the course of the autopsy?

Commander HUMES. My first assistant was Commander J. Thornton Boswell, whose position is Chief of Pathology at the Naval Medical School, and my other assistant was Lt. Col. Pierre Finck, who is in the wound ballistics section of the Armed Forces Institute of Pathology.

When I ascertained the nature of the President's wounds, having had the facilities of the Armed Forces Institute of Pathology offered to me by General Blumberg, the commanding officer of that institution, I felt it advisable and would be of help to me to have the services of an expert in the field of wound ballistics and for that reason I requested Colonel Finck to appear.

Mr. SPECTER. Tell us who else in a general way was present at the time the autopsy was conducted in addition to you three doctors, please?

Commander HUMES. This, I must preface by saying it will be somewhat incomplete. My particular interest was on the examination of the President and not of the security measures of the other people who were present.

However, the Surgeon General of the Navy was present at one time or another. Admiral Galloway, the Commanding Officer of the National Naval Medical Center; my own commanding officer, Captain John H. Stover of the Naval Medical School, Dr. John Ebersole, one of the radiologists assigned to the Naval Hospital, Bethesda, who assisted with X-ray examinations which were made. These are the chief names, sir; that I can recall.

Mr. SPECTER. What time did the autopsy start approximately?

Commander HUMES. The president's body was received at 25 minutes before 8, and the autopsy began at approximately 8 p.m. on that evening. You must include the fact that certain X-rays and other examinations were made before the actual beginning of the routine type autopsy examination.

Mr. SPECTER. Precisely what X-rays or photographs were taken before the dissection started?

Commander HUMES. Some of these X-rays were taken before and some during the examination which also maintains for the photographs, which were made as the need became apparent to make such.

However, before the postmortem examination was begun, anterior, posterior and lateral X-rays of the head, and of the torso were made, and identification type photographs, I recall having been made of the full face of the late President. A photograph showing the massive head wound with the large defect that was associated with it. To my recollection all of these were made before the proceedings began.

Several others, approximately 15 to 20 in number, were made in total before we finished the proceedings.

Mr. SPECTER. Now were those X-rays or photographs or both when you referred to the total number?

Commander HUMES. By the number I would say they are in number 15 to 20. There probably was ten or 12 X-ray films exposed in addition.

Mr. SPECTER. What time did this autopsy end?

Commander HUMES. At approximately 11 p.m.

Mr. SPECTER. What wounds did you observe on the late President, if any?

Commander HUMES. The wounds which we observed on the President were—excuse me, at this point might I use the charts which I have prepared?

Would that be appropriate?

Mr. SPECTER. Yes; would you like to start with the neck wound?

Commander HUMES. All right, sir.

I might preface my remarks by stating that the President's body was received in our morgue in a closed casket. We opened the casket, Dr. Boswell and I, and the President's body was unclothed in the casket, was wrapped in a sheet labeled by the Parkland Hospital, but he was unclothed once the sheet was removed from his body so we do not have at that time any clothing.

Mr. SPECTER. Dr. Humes, before you identify what that represents let me place Commission Exhibit No. 385 on it so it may be identified.

(The drawing was marked Commission Exhibit No. 385 for identification.)

Commander HUMES. When appraised of the necessity for our appearance before this Commission, we did not know whether or not the photographs which we had made would be available to the Commission. So to assist in making our testimony more understandable to the Commission members, we decided to have made drawings, schematic drawings, of the situation as we saw it, as we recorded it and as we recall it. These drawings were made under my supervision and that of Dr. Boswell by Mr. Rydberg, whose initials are H. A.

He is a hospital corpsman, second class, and a medical illustrator in our command at Naval Medical School.

Mr. SPECTER. Did you provide him with the basic information from which these drawings were made?

Commander HUMES. Yes, sir.

Mr. SPECTER. Distances, that sort of thing?

Commander HUMES. Yes, sir. We had made certain physical measurements of the wounds, and of their position on the body of the late President, and we provided these and supervised directly Mr. Rydberg in making these drawings.

Mr. SPECTER. Have you checked the drawings subsequent to their preparation to verify their accuracy?

Commander HUMES. Yes, sir.

Mr. SPECTER. And proportion?

Commander HUMES. I must state these drawings are in part schematic. The artist had but a brief period of some 2 days to prepare these. He had no photographs from which to work, and had to work under our description, verbal description, of what we had observed.

Mr. SPECTER. Would it be helpful to the artist, in redefining the drawings if that should become necessary, to have available to him the photographs or X-rays of the President?

Commander HUMES. If it were necessary to have them absolutely true to scale. I think it would be virtually impossible for him to do this without the photographs.

Mr. SPECTER. And what is the reason for the necessity for having the photographs?

Commander HUMES. I think that it is most difficult to transmit into physical measurements the—by word the—exact situation as it was seen to the naked eye. The photographs were—there is no problem of scale there because the wounds, if they are changed in size or changed in size and proportion to the structures of the body and so forth, when we attempt to give a description of these findings, it is the bony prominences, I cannot, which we used as points of references, I cannot, transmit completely to the illustrator where they were situated.

Mr. SPECTER. Is the taking of photographs and X-rays routine or is this something out of the ordinary?

Commander HUMES. No, sir; this is quite routine in cases of this sort of violent death in our training. In the field of forensic pathology we have found that the photographs and X-rays are of most value, the X-rays particularly in finding missiles which have a way of going in different directions sometimes, and particularly as documentary evidence these are considered invaluable in the field of forensic pathology.

Mr. SPECTER. Will you now proceed to show us what Commission Exhibit 385 depicts, please?

Commander HUMES. Actually, I think, sir, at this time the view from the posterior aspect would also be of value to the Commission.

This is——

Mr. SPECTER. Doctor, I hand you the second exhibit which is marked Commission Exhibit No. 386.

(Commission Exhibit No. 386 was marked for identification.)

Commander HUMES. I believe at this point I would like to have, if you have my gross autopsy description because I will give the dimensions of these wounds at this time.

Mr. SPECTER. We will use the Commission Exhibit No. 387 and I will ask you first of all, for the record, to identify what this document is, Dr. Humes.

(The document referred to was marked Commission Exhibit No. 387 for identification.)

Commander HUMES. This document is a copy of the gross autopsy report which was prepared by myself, Dr. Boswell, and Dr. Finck, and completed within approximately 48 hours after the assassination of the President.

Mr. SPECTER. Does that report bear your signature at its end?

Commander HUMES. It bears my signature on the first or covering page as well as on my last page, sir.

Mr. SPECTER. Will you now proceed to tell us what you observed with respect to the wound which is marked as appearing in the upper back or lower neck?

Mr. McCLOY. Have you identified that?

Mr. SPECTER. The one on the side is 385 and the one of the rear view is 386. And that one is 387. For purposes of our record, if you will, put them in as 385 and 386 for our printed record. You might want to put them in chalk above them so you will see the one on the left is 385 and on the right is 386.

Commander HUMES. These exhibits again are schematic representations of what we observed at the time of examining the body of the late President.

Exhibit 385 shows in the low neck an oval wound which—excuse me, I wish to get the measurements correct. This wound was situated just above the upper border of the scapula, and measured 7 by 4 milimeters, with its long axis roughly parallel to the long axis of vertical column.

We saw—I would rather not discuss the situation of the anterior neck at this time or would you prefer it?

Mr. SPECTER. How would you prefer to do it, Dr. Humes?

Commander HUMES. I would prefer to discuss the wounds, two wounds, we saw posteriorly and the wound, other wound, of the skull before going to that.

Mr. SPECTER. That is fine, Dr. Humes, do it any way you find convenient. I will give you the other drawing and you can do them both together. Let the third drawing be marked as Commission Exhibit No. 388.

(The drawing referred to was marked Commission Exhibit No. 388 for identification.)

Commander HUMES. The wound in the low neck of which I had previously begun to speak is now posteriorly—is now depicted in 385, in 386 and in 388.

The second wound was found in the right posterior portion of the scalp. This wound was situated approximately 2.5 centimeters to the right, and slightly above the external occiptal protuberance which is a bony prominence situated in the posterior portion of everyone's skull. This wound was then 2½ centimeters to the right and slightly above that point.

The third obvious wound at the time of the examination was a huge defect over the right side of the skull. This defect involved both the scalp and the underlying skull, and from the brain substance was protruding.

This wound measured approximately 13 centimeters in greatest diameter. It was difficult to measure accurately because radiating at various points from the large defect were multiple crisscrossing fractures of the skull which extended in several directions.

I have noted in my report that a detailed description of the lines of these fractures and of the types of fragments that were thus made were very difficult of verbal description, and it was precisely for this reason that the photographs were made so one might appreciate more clearly how much damage had been done to the skull.

Mr. SPECTER. Were the photographs made available then, Dr. Humes, when Exhibit 388 was prepared?

Commander HUMES. No, sir.

Mr. SPECTER. All right.

Commander HUMES. The photographs, to go back a moment, the photographs and the X-rays were exposed in the morgue of the Naval Medical Center on this night, and they were not developed, neither the X-rays or the photographs. They were submitted to the, and here, if I make a mistake I am not certain, to either the Federal Bureau of Investigation or to the Secret Service, I am not sure of those.

Mr. SPECTER. Did you submit those yourself immediately after they were taken, Dr. Humes?

Commander HUMES. Again, one of the senior people present, I believe my own Commanding Officer, Captain Stover, took care of turning this material over to these authorities, and receiving a receipt for this information, for this material. It was—I supervised the positioning of the body for various of these examinations but as far as beyond that, I did not consider that my responsibility.

These, then, were the three wounds which were quite obvious at the time of the examination.

I could expand further on the general appearances of these wounds or I could

turn to the anterior portion of the body and describe various other wounds which were present.

Mr. SPECTER. You were focussing on 388 before I last asked a question, Dr. Humes. Why don't you describe in general terms the nature of the wound which was present at the top of the head of the late President?

Commander HUMES. With your permission, sir, and Mr. Chief Justice, I think I might describe those two wounds together, and describe the defects in the scalp and in the skull in each instance.

Mr. SPECTER. That would be fine.

Commander HUMES. Would that be appropriate?

Mr. SPECTER. Yes.

Commander HUMES. Turning now to Commission Exhibit 388, where we have depicted in the posterior right portion of the skull a wound which we have labeled "in" or a wound of entrance and a large roughly 13 cm. diameter defect in the right lateral vertex of the skull. I would go into some further detail in describing these wounds.

The scalp, I mentioned previously, there was a defect in the scalp and some scalp tissue was not available. However, the scalp was intact completely past this defect. In other words, this wound in the right posterior region was in a portion of scalp which had remained intact.

So, we could see that it was the measurement which I gave before, I believe 15 by 6 millimeters.

When one reflected the scalp away from the skull in this region, there was a corresponding defect through both tables of the skull in this area.

Mr. SPECTER. Will you describe what you mean by both tables, Dr. Humes?

Commander HUMES. Yes, sir.

The skull is composed of two layers of bone. We will put the scalp in in dotted lines.

The two solid lines will represent the two layers of the skull bone, and in between these two layers is loose somewhat irregular bone.

When we reflected the scalp, there was a through and through defect corresponding with the wound in the scalp.

This wound had to us the characteristics of a wound of entrance for the following reason: The defect in the outer table was oval in outline, quite similar to the defect in the skin.

Mr. SPECTER. You are referring there, Doctor, to the wound on the lower part of the neck?

Commander HUMES. No, sir; I am speaking here of the wound in the occiput.

The wound on the inner table, however, was larger and had what in the field of wound ballistics is described as a shelving or a coning effect. To make an analogy to which the members of the Commission are probably most familiar, when a missile strikes a pane of glass, a typical example, a B–B fired by a child's air rifle, when this strikes a pane of glass there will be a small, usually round to oval defect on the side of the glass from whence the missile came and a belled-out or coned-out surface on the opposite side of the glass from whence the missile came.

(At this point, Mr. Dulles entered the hearing room.)

Commander HUMES: Experience has shown and my associates and Colonel Finck, in particular, whose special field of interest is wound ballistics can give additional testimony about this scientifically observed fact.

This wound then had the characteristics of wound of entrance from this direction through the two tables of the skull.

Mr. SPECTER. When you say "this direction," will you specify that direction in relationship to the skull?

Commander HUMES. At that point I mean only from without the skull to within.

Mr. SPECTER. Fine, proceed.

Commander HUMES. Having ascertained to our satisfaction and incidentally photographs illustrating this phenomenon from both the external surface of the skull and from the internal surface were prepared, we concluded that the large defect to the upper right side of the skull, in fact, would represent a wound of exit.

A careful examination of the margins of the large bone defect at that point, however, failed to disclose a portion of the skull bearing again a wound of—a point of impact on the skull of this fragment of the missile, remembering, of course, that this area was devoid of any scalp or skull at this present time. We did not have the bone.

In further evaluating this head wound, I will refer back to the X-rays which we had previously prepared. These had disclosed to us multiple minute fragments of radio opaque material traversing a line from the wound in the occiput to just above the right eye, with a rather sizable fragment visible by X-ray just above the right eye. These tiny fragments that were seen dispersed through the substance of the brain in between were, in fact, just that extremely minute, less than 1 mm. in size for the most part.

(At this point, Senator Cooper entered the hearing room.)

Mr. SPECTER. Dr. Humes, this would be a good juncture to produce two photographs.

May it please the Commission, Mr. Chief Justice Warren, I have identified as Commission Exhibits 389 and 390 which will at a later time be identified as being two frames from the motion picture camera operated by one Abraham Zapruder, being the amateur photographer who was on the scene, which I think would assist in evaluating the angle of the President's head corresponding to that exhibit designated as 388.

I will hand those to you, Dr. Humes, and ask you if you would state for the record the relative position of the President's head in 389 which is a frame about one-sixteenth of a second before the point of impact shown in Exhibit 390.

(The frames referred to were marked Commission Exhibits Nos. 389 and 390 for identification.)

Commander HUMES. It will be noted in Exhibit 389 that the President's head is bent considerably forward and perhaps somewhat to the left in this frame of the photograph 389.

Mr. SPECTER. Is that in approximately the same position as the angle of the head depicted in Commission Exhibit No. 388?

Commander HUMES. Yes, sir; it is.

Mr. SPECTER. Mr. Chief Justice, at this time I would like to move for admission in evidence of Exhibits 385 through 390.

The CHAIRMAN. They may be admitted under those numbers.

(Commission Exhibits Nos. 385, 386, 387, 388, 389, and 390, previously marked for identification, were received in evidence.)

Mr. SPECTER. Will you proceed now, Dr. Humes, to continue in your description of the head wound?

Commander HUMES. Head wound—a careful inspection of this large defect in the scalp and skull was made seeking for fragments of missile before any actual detection was begun. The brain was greatly lacerated and torn, and in this area of the large defect we did not encounter any of these minute particles.

I might say at this time that the X-ray pictures which were made would have a tendency to magnify these minute fragments somewhat in size and we were not too surprised in not being able to find the tiny fragments depicted in the X-ray.

Mr. SPECTER. Approximately how many fragments were observed, Dr. Humes, on the X-ray?

Commander HUMES. I would have to refer to them again, but I would say between 30 or 40 tiny dustlike particle fragments of radio opaque material, with the exception of this one I previously mentioned which was seen to be above and very slightly behind the right orbit.

Mr. DULLES. Were these all fragments that were injected into the skull by the bullet?

Commander HUMES. Our interpretation is, sir, that the missile struck the right occipital region, penetrated through the two tables of the skull, making the characteristic coning on the inner table which I have previously referred to. That one portion of the missile and judging by the size of the defect thus produced, the major portion of the missile, made its exit through this large defect.

A second portion of the missile or multiple second portions were deflected, and

traversed a distance as enumerated by this interrupted line, with the major portion of that fragment coming to lodge in the position indicated.

Perhaps some of these minor fragments were dislodged from the major one as it traversed this course.

To better examine the situation with regard to the skull, at this time, Dr. Boswell and I extended the lacerations of the scalp which were at the margins of this wound, down in the direction of both of the President's ears. At that point, we had even a better appreciation of the extensive damage which had been done to the skull by this injury.

We had to do virtually no work with a saw to remove these portions of the skull, they came apart in our hands very easily, and we attempted to further examine the brain, and seek specifically this fragment which was the one we felt to be of a size which would permit us to recover it.

Mr. SPECTER. When you refer to this fragment, and you are pointing there, are you referring to the fragment depicted right above the President's right eye?

Commander HUMES. Yes, sir; above and somewhat behind the President's eye.

Mr. SPECTER. Will you proceed, then, to tell us what you did then?

Commander HUMES. Yes, sir. We dissected carefully in this region and in fact located this small fragment, which was in a defect in the brain tissue in just precisely this location.

Mr. SPECTER. How large was that fragment, Dr. Humes?

Commander HUMES. I refer to my notes for the measurements of that fragment.

I find in going back to my report, sir, that we found, in fact, two small fragments in this approximate location. The larger of these measured 7 by 2 mm., the smaller 3 by 1 mm.

To make my presentation of this wound of the skull more logical to the Commission, I would like to go forward in time that evening to at a later hour. I apologize—time and what happened exactly at what moment escapes me at this time.

I mentioned previously that there was a large bony defect. Some time later on that evening or very early the next morning while we were all still engaged in continuing our examination, I was presented with three portions of bone which had been brought to Washington from Dallas by the agents of the Federal Bureau of Investigation.

These were——

Mr. SPECTER. Might that have been by a Secret Service agent?

Commander HUMES. It could be, sir; these things——

Mr. SPECTER. At any rate, someone presented these three pieces of bone to you?

Commander HUMES. Someone presented these three pieces of bone to me, I do not recall specifically their statement as to where they had been recovered.

It seems to me they felt it had been recovered either in the street or in the automobile, I don't recall specifically.

We were most interested in these fragments of bone, and found that the three pieces could be roughly put together to account for a portion of this defect.

Mr. SPECTER. How much remained unaccounted for, Dr. Humes?

Commander HUMES. I would estimate that approximately one-quarter of that defect was unaccounted for by adding these three fragments together and seeing what was left.

This is somewhat difficult, because as back to when we were actually looking for the fragments of metal, as we moved the scalp about, fragments of various sizes would fall to the table, and so forth, so it was difficult to put that exact figure into words.

However, the thing which we considered of importance about these three fragments of bone was that at the margins of one of them which was roughly pyramidal in shape, there was a portion of the circumference of what we interpreted as a missile wound. We thus interpreted it this because there was, the size was, sufficiently large for us, for it to have the curve of the skull still evident. At the point of this defect, and I will draw both tables of the bone in this defect, at the area which we interpreted as the margin of a missile wound, there was a shelving of the margin.

This would, to us, mean that a missile had made this wound from within the skull to the exterior. To confirm that this was a missile wound, X-rays were made of that fragment of bone, which showed radio-opaque material consistent and similar in character to the particles seen within the skull to be deposited in the margins of this defect, in this portion of the bone.

Mr. SPECTER. Then what conclusion did you reach as to what caused that hole reconstructed from the three portions of the late President's scalp?

Commander HUMES. We reached the conclusion a missile entered the left—the right posterior inferior portion——

Mr. SPECTER. Doctor, perhaps it would be helpful if you would refer to that as letter "A" and the exit as letter "B", so that the record is clear on those two points and perhaps it will be helpful to your description as well.

And would you mark them as well, with a pencil?

Commander HUMES. That is not entry for the second.

Mr. SPECTER. Exit for the second?

Commander HUMES. I will label 388 with the letter "A" to indicate our opinion as to the wound of entrance into the skull.

I will label as Point "B" the area of exit of a portion of the missile that entered posteriorly, I say a portion because a small fragment was seen in the position previously noted which was recovered.

However, we concluded that a very significant portion, perhaps the largest portion, made its exit and accounted for this very large defect for the multiple fractures of the skull and for the loss of brain and scalp tissue at this point.

Mr. SPECTER. Will you describe at this juncture the damage which was inflicted upon the brain, please?

Commander HUMES. May I refer at this point to the gross description of the brain prepared separately?

Mr. SPECTER. Certainly, Dr. Humes, if you prefer to do it in that order.

Commander HUMES. I believe you have that. It is the second portion of the report.

Mr. SPECTER. Yes, sir. I can make that available to you here.

Commander HUMES. While that is being provided, when we reflected the scalp away from the badly damaged skull, and removed some of these loosened portions of skull bone, we were able to see this large defect in the right cerebral hemisphere. It corresponded roughly in size with the greatest diameter of the defect in the scalp measuring some 13 cm.

Mr. SPECTER. May the record now show I am handing to you, Dr. Humes, an exhibit marked Commission Exhibit 391, and will you identify what that is, please, Doctor?

Commander HUMES. Exhibit 391 is listed as a supplementary report on the autopsy of the late President Kennedy, and was prepared some days after the examination.

This delay necessitated by, primarily, our desire to have the brain better fixed with formaldehyde before we proceeded further with the examination of the brain which is a standard means of approach to study of the brain.

The brain in its fresh state does not lend itself well to examination.

From my notes of the examination, at the time of the post-mortem examination, we noted that clearly visible in the large skull defect and exuding from it was lacerated brain tissue which, on close inspection proved to represent the major portion of the right cerebral hemisphere.

We also noted at this point that the flocculus cerebri was extensively lacerated and that the superior sagittal sinus which is a venous blood containing channel in the top of the meninges was also lacerated.

To continue to answer your question with regard to the damage of the brain, following the formal infixation, Dr. Boswell, Dr. Finck and I convened to examine the brain in this state.

We also prepared photographs of the brain from several aspects to depict the extent of these injuries.

We found that the right cerebral hemisphere was markedly disrupted. There was a longitudinal laceration of the right hemisphere which was parasagittal in position. By the saggital plane, as you may know, is a plane in the midline which would divide the brain into right and left halves.

This laceration was parasagittal. It was situated approximately 2.5 cm. to the right of the midline, and extended from the tip of occipital lobe, which is the posterior portion of the brain, to the tip of the frontal lobe which is the most anterior portion of the brain, and it extended from the top down to the substance of the brain a distance of approximately 5 or 6 cm.

The base of the laceration was situated approximately 4.5 cm. below the vertex in the white matter. By the vertex we mean—the highest point on the skull is referred to as the vertex.

The area in which the greatest loss of brain substance was particularly in the parietal lobe, which is the major portion of the right cerebral hemisphere.

The margins of this laceration at all points were jagged and irregular, with additional lacerations extending in varying directions and for varying distances from the main laceration.

In addition, there was a laceration of the corpus callosum which is a body of fibers which connects the two hemispheres of the brain to each other, which extended from the posterior to the anterior portion of this structure, that is the corpus callosum. Exposed in this laceration were portions of the ventricular system in which the spinal fluid normally is disposed within the brain.

When viewed from above the left cerebral hemisphere was intact. There was engorgement of blood vessels in the meninges covering the brain. We note that the gyri and sulci, which are the convolutions of the brain over the left hemisphere were of normal size and distribution.

Those on the right were too fragmented and distorted for satisfactory description.

When the brain was turned over and viewed from its basular or inferior aspect, there was found a longitudinal laceration of the mid-brain through the floor of the third ventricle, just behind the optic chiasma and the mammillary bodies.

This laceration partially communicates with an oblique 1.5 cm. tear through the left cerebral peduncle. This is a portion of the brain which connects the higher centers of the brain with the spinal cord which is more concerned with reflex actions.

There were irregular superficial lacerations over the basular or inferior aspects of the left temporal and frontal lobes. We interpret that these later contusions were brought about when the disruptive force of the injury pushed that portion of the brain against the relative intact skull.

This has been described as contre-coup injury in that location.

This, then, I believe, Mr. Specter, are the major points with regard to the President's head wound.

Mr. SPECTER. Do you have an opinion, Dr. Humes, as to whether there were dumdum bullets used specifically on this wound which struck point "A" of the head, on 388?

Commander HUMES. I believe these were not dumdum bullets, Mr. Specter. A dumdum bullet is a term that has been used to describe various missiles which have a common characteristic of fragmenting extensively upon striking.

Mr. SPECTER. Would you characterize the resultant effect on this bullet as not extensive fragmenting?

Commander HUMES. Yes. Had this wound on point "A" on Exhibit 388 been inflicted by a dumdum bullet, I would anticipate that it would not have anything near the regular contour and outline which it had. I also would anticipate that the skull would have been much more extensively disrupted, and not have, as was evident in this case, a defect which quite closely corresponded to the overlying skin defect because that type of a missile would fragment on contact and be much more disruptive at this point.

Mr. SPECTER. At this point would you state for the record the size and approximate dimension of the major wound on the top of the head which you have marked wound "B"?

Commander HUMES. This was so large, that localization of it in a descriptive way is somewhat difficult.

However, we have mentioned that its major—its greatest dimension was approximately 13 cm. The reason it was difficult to measure is that various

fracture lines extend out from it in a quite irregular fashion, but it was approximately 13 cm.

Mr. McCLOY. This red that is marked on 388 on the base of the skull, is that seepage or what?

Commander HUMES. No, sir; that is to depict the musculature at the base of the neck.

Mr. McCLOY. I see.

Commander HUMES. That is not taken to depict the blood, sir.

Mr. SPECTER. On the reconstruction of the three portions of the scalp which you described——

Commander HUMES. Skull, sir.

Mr. SPECTER. Skull, which enabled you to reconstruct a point of exit of the bullet, will you state at this point of the record that size of opening or exit path of the bullet?

Commander HUMES. As I mentioned previously, at one angle of this largest pyramidal shaped fragments of bone which came as a separate specimen, we had the portion of the perimeter of a roughly what we would judge to have been a roughly circular wound of exit. Judging from that portion of the perimeter which was available to us, we would have judged the diameter of that wound to be between 2.5 and 3 cm.

Mr. SPECTER. Doctor Humes, have you now described the major characteristics and features of the wounds to the late President's head?

Commander HUMES. I believe that I have, sir.

Mr. SPECTER. All right. Will you now turn your attention, please to the wound which is noted on 385 and 386 being at the——

Mr. McCLOY. Before we leave that, could I ask a question?

When you talk about dumdum bullets, do you include the ordinary type of soft nose sporting bullets, maybe this is something that Colonel Finck would be more expert on, but was that, was the bullet, could it possibly have been a sporting type of hunting bullet that has a soft nose but is still somewhat firm?

Commander HUMES. From the characteristics of this wound, Mr. McCloy, I would believe that it must have had a very firm head rather than a soft head.

Mr. McCLOY. Steel jacketed, would you say, copper jacketed bullet?

Commander HUMES. I believe more likely a jacketed bullet because of the regular outline which was present.

Mr. McCLOY. All right.

Mr. DULLES. Could I ask a question?

The CHAIRMAN. Mr. Dulles.

Mr. DULLES. Believing that we know the type of bullet that was usable in this gun, would this be the type of wound that might result from that kind of a bullet?

Commander HUMES. I believe so, sir.

Mr. DULLES. If my question is clear——

Commander HUMES. Yes, sir; it is.

Mr. DULLES. We think we know what the bullet is, we may be wrong but we think we know what it was, is this wound consistent with that type of bullet?

Commander HUMES. Quite consistent, sir.

Mr. McCLOY. There is no evidence of any keyholing of the bullet before it hit, before the point of impact?

Commander HUMES. I don't exactly follow your question.

Mr. McCLOY. Was the bullet moving in a direct line or had it begun to tumble?

Commander HUMES. To tumble?

That is a difficult question to answer. I have the opinion, however, that it was more likely moving in a direct line. You will note that the wound in the posterior portion of the occiput on Exhibit 388 is somewhat longer than the other missile wound which we have not yet discussed in the low neck. We believe that rather than due to a tumbling effect, this is explainable on the fact that this missile struck the skin and skull at a more tangential angle than did the other missile, and, therefore, produced a more elongated defect, sir.

Senator COOPER. May I ask a question there? Perhaps you have done this.

but if not, how would you explain the difference of the courses of the fragments which you traced and described as, I think, being discovered behind the right eye?

Commander HUMES. Yes, sir.

Senator COOPER. And the course of the fragment which was believed caused the large defect?

Commander HUMES. Caused the large defect?

Senator COOPER. How do you explain——

Commander HUMES. The discrepancy?

Senator COOPER. The difference in the courses.

Commander HUMES. Yes, sir.

As this missile penetrated the scalp, it then came upon a very firm substance, the hard skull, and I believe that this track depicted by the dotted lines on Exhibit 388 was a portion of that missile which was dislodged as it made its defect in the skull. And that—that another portion, and, as I say, presumably, by the size of the defect, a more major portion made its exit through the right lateral side of the skull.

Mr. MCCLOY. Is this piece of pyramidal bone that was brought in to you subsequently as I understand it——

Commander HUMES. Yes, sir.

Mr. MCCLOY. Was that part of the outer table or the inner table?

Commander HUMES. It was both tables, sir.

Mr. MCCLOY. Both tables?

Commander HUMES. Yes, sir; had it only been one it might have been difficult to ascertain whether it was.

Mr. MCCLOY. Shelving or not?

Commander HUMES. Yes, sir; in or out, but it encompassed both tables, sir.

Mr. DULLES. Is the angle of declination that you—one sees there from in and out approximately the angle you think at which the bullet was traveling at the time of impact and exit?

Commander HUMES. That is our impression, sir.

Mr. DULLES. So then the shot would have been fired from some point above the head of the person hit?

Commander HUMES. Yes, sir.

Mr. SPECTER. Dr. Humes, would you elaborate a bit on the differences in the paths, specifically why the bullet went in one direction in part and in part in the second direction, terminating with the fragment right over the right eye?

Commander HUMES. Yes, sir.

I will make a drawing of the posterior portion of the skull showing again this beveling which we observed at the inner table of the skull.

Our impression is that as this projectile impinged upon the skull in this fashion, a small portion of it was dislodged due to the energy expended in that collision, if you will, and that it went off at an angle, and left the track which is labeled 388, which is labeled on Exhibit 388 from "A", point "A" to the point where the fragment was found behind the eye.

Why a fragment takes any particular direction like that is something which is difficult of scientific explanation. Those of us who have seen missiles strike bones, be it the skull or a bone in the extremity, have long since learned that portions of these missiles may go off in various directions and the precise physical laws governing them are not clearly understood.

Mr. SPECTER. Would the angle be accentuated in any way if you were to assume the President was in a moving automobile going in a slight downhill direction?

Commander HUMES. There are many variables under these circumstances. The most—the crucial point, I believe, to be the relative position of the President's head in relation to the flight of the missile.

Now, this would be influenced by how far his head was bent, by the situation with regard to the level of the seat in the vehicle, off of the horizontal, and so forth.

Mr. SPECTER. How about a decline in the path of the road itself?

Commander HUMES. I think that that would have a tendency to accentuate this angle, yes, sir.

Mr. SPECTER. Mr. Chief Justice, I would like to move for the admission in evidence now of Exhibit 391, which is the exhibit on the brain report.

The CHAIRMAN. It may be admitted.

(The document heretofore marked for identification as Commission Exhibit No. 391 was received in evidence.)

Mr. SPECTER. Dr. Humes, would you now move over to the wound which appears on the lower part of the neck and upper part of the back?

Mr. DULLES. Could I ask one more question before we get to that, I am sorry.

Mr. SPECTER. Certainly.

Mr. DULLES. Could one say as to what portion of the bullet was found in all these fragments, I mean arrive at an estimate, was it a tenth of the bullet, was it, how much was it, assuming the type of bullet that we believe was used in this particular rifle.

Commander HUMES. Sir, I have not had the opportunity to personally examine the type of bullet which is believed to have been represented by this injury.

However, I would estimate—if I understand you correctly the total amount that was present in the President's skull and brain?

Mr. DULLES. Yes.

Commander HUMES. Including the fragment?

Mr. DULLES. Including all the fragments.

Commander HUMES. Including all these minute particles. I would say there was something less than one-tenth of the total volume of the missile.

Mr. SPECTER. Dr. Humes, do you make that calculation on the assumption that the bullets used here were 6.5 mm. Mannlicher-Carcano rifle bullet weighing 158.6 grams?

Commander HUMES. Yes, I do; sir.

Mr. SPECTER. Had I brought that particular fact to your attention prior to the time you started testifying here today?

Commander HUMES. Yes, sir. One point I intended to make clear these fragments which I recovered from this position were turned over to the Secret Service.

I presume that they have made physical measurements including the weight of them, and could give a much more intelligent estimate of the proportion than I. I would say, however, that we did not deliver these minute fragments because they were so small as to be essentially unrecoverable.

So, obviously they were of a very small portion of the major missile.

Mr. DULLES. These minute fragments were part of the bullet, emanations from the bullet?

Commander HUMES. Yes, sir.

Mr. DULLES. They were not from the head?

Commander HUMES. No, sir, they were small, dust, of the size of dust particles, however.

Mr. DULLES. Is the posture of the head of that figure there, the inclination of it, roughly the inclination that you think the President's head had at the time from the other photographs?

Commander HUMES. Yes, sir. From the photographs and based on the physical examination of this wound, yes, sir.

Mr. DULLES. That is all I have.

Mr. MCCLOY. Perhaps this was something that Colonel Finck could testify to exactly, but, he would be quite competent. Is there anything to indicate that this was, might have been a larger than a 6.5 or smaller than a 6.5?

Commander HUMES. The size of the defect in the scalp, caused by a projectile could vary from missile to missile because of elastic recoil and so forth of the tissues.

However, the size of the defect in the underlying bone is certainly not likely to get smaller than that of the missile which perforated it, and in this case, the smallest diameter of this was approximately 6 to 7 mm., so I would feel that that would be the absolute upper limit of the size of this missile, sir.

Mr. MCCLOY. Seven would be the absolute upper limit?

Commander HUMES. Yes, sir; and, of course, just a little tilt could make it a little larger, you see.

Mr. DULLES. I have one other question, if I may.

Is the incidence of clean entry as indicated there, and then great fragmentation on exit, is that a normal consequence of this type of wound?

Commander HUMES. Sir, we feel that there are two potential explanations for this.

One, having traversed the skull in entrance in the occiput as depicted on 388, the missile begins to tumble, and in that fashion it presents a greater proportion of its surface to the brain substance and to the skull as it makes its egress.

The other and somewhat more difficult to measure and perhaps Colonel Finck will be able to testify in greater detail on this, is that a high velocity missile has tremendous kinetic energy, and this energy is expanded against the structures which it strikes, and so that much of this defect could be of the nature of blast, as this kinetic energy is dissipated by traversing the skull.

Is that the sense of the question, sir?

Mr. DULLES. Yes.

Senator COOPER. I will ask a question, and perhaps this isn't in your field.

But assuming that the shot which struck President Kennedy at point A was fired by a gun from the window of the Texas School Book Depository, and which has been testified to, and assuming that you could locate the position of the President at the time he was struck by a bullet, you could then, could you not, establish the degree of the missile?

Commander HUMES. The degree of angle?

Senator COOPER. The angle, yes, the degree of angle of the missile from the building.

Commander HUMES. Yes, sir; there is one difficulty, and that is the defect of exit was so broad that one has to rely more on the inclination of the entrance than they do connecting in this instance entrance and exit because so much of the skull was carried away in this fashion.

Senator COOPER. That was my second question.

My first question was would it be possible physically to establish the degree of angle of the trajectory of the bullet?

Commander HUMES. Within limited accuracy, sir.

Senator COOPER. Within limited accuracy.

That being true then my second question was whether the point of entry of the bullet, point A, and the, what you call the exit——

Commander HUMES. Exit.

Senator COOPER. Did you establish them so exactly that they could be related to the degree of angle of the trajectory of the bullet?

Commander HUMES. Yes, sir; to our satisfaction we did ascertain that fact.

Mr. DULLES. Just one other question.

Am I correct in assuming from what you have said that this wound is entirely inconsistent with a wound that might have been administered if the shot were fired from in front or the side of the President: it had to be fired from behind the President?

Commander HUMES. Scientifically, sir, it is impossible for it to have been fired from other than behind. Or to have exited from other than behind.

Mr. MCCLOY. This is so obvious that I rather hesitate to ask it. There is no question in your mind that it was a lethal bullet?

Commander HUMES. The President, sir, could not possibly have survived the effect of that injury no matter what would have been done for him.

The CHAIRMAN. Mr. Specter.

Mr. SPECTER. What conclusions did you reach then as to the trajectory or point of origin of the bullet, Dr. Humes, based on 388?

Commander HUMES. We reached the conclusion that this missile was fired toward the President from a point above and behind him, sir.

Mr. SPECTER. Now, on one detail on your report, Dr. Humes, on page 4, on the third line down, you note that there is a lacerated wound measuring 15 by 6 mm. which on the smaller size is, of course, less than 6.5 mm.?

Commander HUMES. Yes, sir.

Mr. SPECTER. What would be the explanation for that variation?

Commander HUMES. This is in the scalp, sir, and I believe that this is explainable on the elastic recoil of the tissues of the skin, sir. It is not infre-

quent in missile wounds of this type that the measured wound is slightly smaller than the caliber of the missile that traversed it.

Mr. SPECTER. Would you proceed, now then to the other major wound of entry which you have already noted and described?

Commander HUMES. Yes, sir.

Mr. SPECTER. Its point of origin, where it hit the President.

Commander HUMES. I—our previously submitted report, which is Commission No. 387, identified a wound in the low posterior neck of the President.

The size of this wound was 4 by 7 mm., with the long axis being in accordance with the long axis of the body, 44 mm. wide, in other words, 7 mm. long.

We attempted to locate such wounds in soft tissue by making reference to bony structures which do not move and are, therefore, good reference points for this type of investigation.

We then ascertained, we chose the two bony points of reference—we chose to locate this wound, where the mastoid process, which is just behind the ear, the top of the mastoid process, and the acromion which is the tip of the shoulder joint. We ascertained physical measurement at the time of autopsy that this wound was 14 cm. from the tip of the mastoid process and 14 cm. from the acromion was its central point—

Mr. SPECTER. That is the right acromion?

Commander HUMES. The tip of the right acromion, yes, sir, and that is why we have depicted it in figure 385 in this location.

This wound appeared physically quite similar to the wound which we have described before in 388 "A," with the exception that its long axis was shorter than the long axis of the wound described above. When the tissues beneath this wound were inspected, there was a defect corresponding with the skin defect in the fascia overlying the musculature of the low neck and upper back.

I mentioned previously that X-rays were made of the entire body of the late President. Of course, and here I must say that as I describe something to you, I might have done it before or after in the description but for the sake of understanding, we examined carefully the bony structures in this vicinity as well as the X-rays, to see if there was any evidence of fracture or of deposition of metallic fragments in the depths of this wound, and we saw no such evidence, that is no fracture of the bones of the shoulder girdle, or of the vertical column, and no metallic fragments were detectable by X-ray examination.

Attempts to probe in the vicinity of this wound were unsuccessful without fear of making a false passage.

Mr. SPECTER. What do you mean by that, Doctor?

Commander HUMES. Well, the defect in the fascia was quite similar, which is the first firm tissue over the muscle beneath the skin, was quite similar to this. We were unable, however, to take probes and have them satisfactorily fall through any definite path at this point.

Now, to explain the situation in the President's neck, I think it will be necessary for me to refer back to Exhibit 385, I believe the number is correct.

Mr. SPECTER. Yes; please do, that is 385.

Commander HUMES. Now, as the President's body was viewed from anteriorly in the autopsy room, and saying nothing for the moment about the missile, there was a recent surgical defect in the low anterior neck, which measured some 7 or 8 cm. in length or let's say a recent wound was present in this area.

This wound was through the skin, through the subcutaneous tissues and into the larynx. Or rather into the trachea of the President.

Mr. SPECTER. To digress chronologically——

Commander HUMES. Yes.

Mr. SPECTER. Did you have occasion to discuss that wound on the front side of the President with Dr. Malcolm Perry of Parkland Hospital in Dallas?

Commander HUMES. Yes, sir; I did. I had the impression from seeing the wound that it represented a surgical tracheotomy wound, a wound frequently made by surgeons when people are in respiratory distress to give them a free airway.

To ascertain that point, I called on the telephone Dr. Malcolm Perry and discussed with him the situation of the President's neck when he first examined

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the President, and asked him had he in fact done a tracheotomy which was somewhat redundant because I was somewhat certain he had.

He said, yes; he had done a tracheotomy and that as the point to perform his tracheotomy he used a wound which he had interpreted as a missile wound in the low neck, as the point through which to make the tracheotomy incision.

Mr. SPECTER. When did you have that conversation with him, Dr. Humes?

Commander HUMES. I had that conversation early on Saturday morning, sir.

Mr. SPECTER. On Saturday morning, November 23d?

Commander HUMES. That is correct, sir.

Mr. SPECTER. And have you had occasion since to examine the report of Parkland Hospital which I made available to you?

Commander HUMES. Yes, sir; I have.

Mr. SPECTER. May it please the Commission, I would like to note this as Commission Exhibit No. 392, and subject to later technical proof, to have it admitted into evidence at this time for the purpose of having the doctor comment about it.

The CHAIRMAN. It may be so marked.

(The document referred to was marked Commission Exhibit No. 392, for identification.)

Mr. SPECTER. What did your examination of the Parkland Hospital records disclose with respect to this wound on the front side of the President's body?

Commander HUMES. The examination of this record from Parkland Hospital revealed that Doctor Perry had observed this wound as had other physicians in attendance upon the President, and actually before a tracheotomy was performed surgically, an endotracheal tube was placed through the President's mouth and down his larynx and into his trachea which is the first step in giving satisfactory airway to a person injured in such fashion and unconscious.

The President was unconscious and it is most difficult to pass such a tube when the person is unconscious.

The person who performed that procedure, that is instilled the endotrachea tube noted that there was a wound of the trachea below the larynx, which corresponded in essence with the wound of the skin which they had observed from the exterior.

Mr. SPECTER. How is that wound described, while you are mentioning the wound?

Commander HUMES. Yes, sir.

Mr. SPECTER. I think you will find that on the first page of the summary sheet, Dr. Humes.

Commander HUMES. Yes, sir. Thank you.

This report was written by doctor—or of the activities of Dr. James Carrico, Doctor Carrico in inserting the endotracheal tube noted a ragged wound of trachea immediately below the larynx.

The report, as I recall it, and I have not studied it in minute detail, would indicate to me that Doctor Perry realizing from Doctor Carrico's observation that there was a wound of the trachea would quite logically use the wound which he had observed as a point to enter the trachea since the trachea was almost damaged, that would be a logical place in which to put his incision.

In speaking of that wound in the neck, Doctor Perry told me that before he enlarged it to make the tracheotomy wound it was a "few millimeters in diameter."

Of course by the time we saw it, as my associates and as you have heard, it was considerably larger and no longer at all obvious as a missile wound.

The report states, and Doctor Perry told me in telephone conversation that there was bubbling of air and blood in the vicinity of this wound when he made the tracheotomy. This caused him to believe that perhaps there had been a violation of one of the—one or other of the pleural cavities by a missile. He, therefore, asked one of his associates, and the record is to me somewhat confused as to which of his associates, he asked one of his associates to put in a chest tube. This is a maneuver which is, was quite logical under the circumstances, and which would, if a tube that were placed through all layers of the wall of the chest, and the chest cavity had been violated one could remove air that had gotten in there and greatly assist respiration.

So when we examined the President in addition to the large wound which

we found in conversation with Doctor Perry was the tracheotomy wound, there were two smaller wounds on the upper anterior chest.

Mr. DULLES. These are apparently exit wounds?

Commander HUMES. Sir, these were knife wounds, these were incised wounds on either side of the chest, and I will give them in somewhat greater detail.

These wounds were bilateral, they were situated on the anterior chest wall in the nipple line, and each were 2 cm. long in the transverse axis. The one on the right was situated 11 cm. above the nipple—the one on the left was situated 11 cm. on the nipple, and the one on the right was 8 cm. above the nipple. Their intention was to incise through the President's chest to place tubes into his chest.

We examined those wounds very carefully, and found that they, however, did not enter the chest cavity. They only went through the skin.

I presume that as they were performing that procedure it was obvious that the President had died, and they didn't pursue this.

To complete the examination of the area of the neck and the chest, I will do that together, we made the customary incision which we use in a routine postmortem examination which is a Y-shaped incision from the shoulders over the lower portion of the breastbone and over to the opposite shoulder and reflected the skin and tissues from the anterior portion of the chest.

We examined in the region of this incised surgical wound which was the tracheotomy wound and we saw that there was some bruising of the muscles of the neck in the depths of this wound as well as laceration or defect in the trachea.

At this point, of course, I am unable to say how much of the defect in the trachea was made by the knife of the surgeon, and how much of the defect was made by the missile wound. That would have to be ascertained from the surgeon who actually did the tracheotomy.

There was, however, some ecchymosis or contusion, of the muscles of the right anterior neck inferiorly, without, however, any disruption of the muscles or any significant tearing of the muscles.

The muscles in this area of the body run roughly, as you see as he depicted them here. We have removed some of them for a point I will make in a moment, but it is our opinion that the missile traversed the neck and slid between these muscles and other vital structures with a course in the neck such as the carotid artery, the jugular vein and other structures because there was no massive hemmorhage or other massive injury in this portion of the neck.

In attempting to relate findings within the President's body to this wound which we had observed low in his neck, we then opened his chest cavity, and we very carefully examined the lining of his chest cavity and both of his lungs. We found that there was, in fact, no defect in the pleural lining of the President's chest.

It was completely intact.

However, over the apex of the right pleural cavity, and the pleura now has two layers. It has a parietal or a layer which lines the chest cavity and it has a visceral layer which is intimately in association with the lung.

As depicted in figure 385, in the apex of the right pleural cavity there was a bruise or contusion or eccmymosis of the parietal pleura as well as a bruise of the upper portion, the most apical portion of the right lung.

It, therefore, was our opinion that the missile while not penetrating physically the pleural cavity, as it passed that point bruised either the missile itself, or the force of its passage through the tissues, bruised both the parietal and the visceral pleura.

The area of discoloration on the apical portion of the right upper lung measured five centimeters in greatest diameter, and was wedge shaped in configuration, with its base toward the top of the chest and its apex down towards the substance of the lung.

Once again Kodachrome photographs were made of this area in the interior of the President's chest.

Mr. SPECTER. Would you mark the point on Exhibit 385, the one on the rear of the President as point "C" and the one on the front of the President as point "D" so we can discuss those, Dr. Humes?

Now, what conclusion did you reach, if any, as to whether point "C" was the point of entry or exit?

Commander HUMES. We reached the conclusion that point "C" was a point of entry.

Mr. SPECTER. What characteristics of that wound led you to that conclusion?

Commander HUMES. The characteristics here were basically similar to the characteristics above, lacking one very valuable clue or piece of evidence rather than clue, because it is more truly a piece of evidence in the skull. The skull as I mentioned before had the bone with the characteristic defect made as a missile traverses bone.

This missile, to the best of our ability to ascertain, struck no bone protuberances, no bony prominences, no bones as it traversed the President's body. But it was a sharply delineated wound. It was quite regular in its outline. It measured, as I mentioned, 7 by 4 mm. Its margins were similar in all respects when viewed with the naked eye to the wound in the skull, which we feel incontrovertibly was a wound of entrance.

The defect in the fascia which is that layer of connective tissue over the muscle just beneath the wound corresponded virtually exactly to the defect in the skin.

And for these reasons we felt that this was a wound of entrance.

Mr. SPECTOR. Did you search the body to determine if there was any bullet inside the body?

Commander HUMES. Before the arrival of Colonel Finck we had made X-rays of the head, neck and torso of the President, and the upper portions of his major extremities, or both his upper and lower extremities. At Colonel Finck's suggestion, we then completed the X-ray examination by X-raying the President's body in toto, and those X-rays are available.

Mr. SPECTER. What did those X-rays disclose with respect to the possible presence of a missile in the President's body?

Commander HUMES. They showed no evidence of a missile in the President's body at any point. And these were examined by ourselves and by the radiologist, who assisted us in this endeavor.

Mr. SPECTER. What conclusion, if any, did you reach as to whether point "D" on 385 was the point of entrance or exit?

Commander HUMES. We concluded that this missile depicted in 385 "C" which entered the President's body traversed the President's body and made its exit through the wound observed by the physicians at Parkland Hospital and later extended as a tracheotomy wound.

Mr. SPECTER. Does the description "ragged wound" which is found in the Parkland report shed any light in and of itself as to whether point "D" is an exit or entry wound?

Commander HUMES. I believe, sir, that that statement goes on, ragged wound in the trachea. I don't believe that refers to the skin. And you might say that it is a ragged wound is more likely to be a wound of exit.

However, the trachea has little cartilaginous rings which have a tendency, which would be disrupted by this, and most wounds of the trachea unless very cleverly incised would perhaps appear slightly ragged.

Mr. SPECTOR. Now, what was the angle, if any, that you observed on the path of the bullet, as you outlined it?

Commander HUMES. The angle which we observed in measuring, in comparing the point of entrance, our point of entrance labeled "C" on 385 and "D" point of exit is one that the point of exit is below the point of entrance compared with the vertical.

Mr. SPECTOR. Have you had an opportunity to examine the clothing which has been identified for you as being that worn by the President on the day of the assassination?

Commander HUMES. Yes; yesterday, just shortly before the Commission hearing today was begun, Mr. Chief Justice, we had opportunity for the first time to examine the clothing worn by the late President.

In private conversation among ourselves before this opportunity, we predicted we would find defects in the clothing corresponding with the defects which were found, of course, on the body of the late President.

Mr. SPECTER. Mr. Chief Justice, may it please the Commission, I would like to have identified for the record three articles on which I have placed Com-

mission Exhibits Nos. 393 being the coat worn by the President, 394 being the shirt, and 395 being the President's tie, and at this time move for their admission into evidence.

The CHAIRMAN. It may be admitted.

(The articles of clothing referred to were marked Commission Exhibits Nos. 393, 394 and 395 for identification, and received in evidence.)

Mr. SPECTER. Taking 393 at the start, Doctor Humes, will you describe for the record what hole, if any, is observable in the back of that garment which would be at or about the spot you have described as being the point of entry on the President's back or lower neck.

Commander HUMES. Yes, sir. This exhibit is a grey suit coat stated to have been worn by the President on the day of his death. Situated to the right of the midline high in the back portion of the coat is a defect, one margin of which is semicircular.

Situated above it just below the collar is an additional defect. It is our opinion that the lower of these defects corresponds essentially with the point of entrance of the missile at Point C on Exhibit 385.

Mr. SPECTER. Would it be accurate to state that the hole which you have identified as being the point of entry is approximately 6 inches below the top of the collar, and 2 inches to the right of the middle seam of the coat?

Commander HUMES. That is approximately correct, sir. This defect, I might say, continues on through the material.

Attached to this garment is the memorandum which states that one half of the area around the hole which was presented had been removed by experts, I believe, at the Federal Bureau of Investigation, and also that a control area was taken from under the collar, so it is my interpretation that this defect at the top of this garment is the control area taken by the Bureau, and that the reason the lower defect is not more circle or oval in outline is because a portion of that defect has been removed apparently for physical examinations.

Mr. SPECTER. Now, does the one which you have described as the entry of the bullet go all the way through?

Commander HUMES. Yes, sir; it goes through both layers.

Mr. SPECTER. How about the upper one of the collar you have described, does that go all the way through?

Commander HUMES. Yes, sir; it goes all the way through. It is not—wait a minute, excuse me—it is not so clearly a puncture wound as the one below.

Mr. SPECTER. Does the upper one go all the way through in the same course?

Commander HUMES. No.

Mr. SPECTER. Through the inner side as it went through the outer side?

Commander HUMES. No, in an irregular fashion.

Mr. SPECTER. Will you take Commission Exhibit 394 and describe what that is, first of all, please?

Commander HUMES. This is the shirt, blood-stained shirt, purportedly worn by the President on the day of his assassination. When viewed from behind at a point which corresponds essentially with the point of defect on the jacket, one sees an irregularly oval defect.

When viewed anteriorly, with the top button buttoned, two additional defects are seen. Of course, with the shirt buttoned, the fly front of the shirt causes two layers of cloth to be present in this location, and that there is a defect in the inner layer of cloth and a corresponding defect in the outer layer of the cloth.

Mr. SPECTER. Is there any observable indication from the fibers on the front side of the shirt to indicate in which direction a missile might have passed through those two tears?

Commander HUMES. From an examination of these defects at this point, it would appear that the missile traversed these two layers from within to the exterior.

Mr. SPECTER. Would it be accurate to state that the hole in the back of the shirt is approximately 6 inches below the top of the collar and 2 inches to the right of the middle seam of the shirt?

Commander HUMES. That is approximately correct, sir.

Mr. SPECTER. Now, how, if at all, do the holes in the shirt and coat conform

to the wound of entrance which you described as point "C" on Commission Exhibit 385?

Commander HUMES. We believe that they conform quite well. When viewing—first of all, the wounds or the defects in 393 and 394 coincide virtually exactly with one another.

They give the appearance when viewed separately and not as part of the clothing of a clothed person as being perhaps, somewhat lower on the Exhibits 393 and 394 than we have depicted them in Exhibit No. 385. We believe there are two reasons for this.

385 is a schematic representation, and the photographs would be more accurate as to the precise location, but more particularly the way in which these defects would conform with such a defect on the torso would depend on the girth of the shoulders and configuration of the base of the neck of the individual, and the relative position of the shirt and coat to the tissues of the body at the time of the impact of the missile.

Mr. SPECTER. As to the muscular status of the President, what was it?

Commander HUMES. The President was extremely well-developed, an extremely well-developed, muscular young man with a very well-developed set of muscles in his thoraco and shoulder girdle.

Mr. SPECTER. What effect would that have on the positioning of the shirt and coat with respect to the position of the neck in and about the seam?

Commander HUMES. I believe this would have a tendency to push the portions of the coat which show the defects here somewhat higher on the back of the President than on a man of less muscular development.

Mr. SPECTER. Mr. Chief Justice, may it please the Commission, I would like to mark for identification Exhibit 396, which later proof will show is a picture of President Kennedy shortly before the first bullet struck him, and ask the doctor to take a look at that.

Will you describe, Doctor Humes, the position of President Kennedy's right hand in that picture?

Commander HUMES. Yes. This exhibit, Commission Exhibit No. 396, allegedly taken just prior to the wounding of the late President, shows him with his hand raised, his elbow bent, apparently in saluting the crowd. I believe that this action——

Mr. SPECTER. Which hand was that?

Commander HUMES. This was his right hand, sir. I believe that this action would further accentuate the elevation of the coat and the shirt with respect to the back of the Presideent.

Mr. SPECTER. Now, Doctor Humes, will you take Commission Exhibit No. 395——

Mr. MCCLOY. Before you go, may I ask a question? In your examination of the shirt, I just want to get it in the record, from your examination of the shirt, there is no defect in the collar of the shirt which coincides with the defect in the back of the President's coat, am I correct?

Commander HUMES. You are correct, sir. There is no such defect.

Mr. SPECTER. As to Commission Exhibit 395, Dr. Humes, will you identify what that is, please?

Commander HUMES. We had an opportunity to examine this exhibit before the Commission met today, sir. This is Commission Exhibit No. 395, and is the neck tie purportedly worn, purportedly to have been worn, by the late President on the day of his assassination.

Mr. SPECTER. What defect, if any, is noted on the tie which would correspond with the path of a missile apparently passing through the folds of the shirt which you have already described?

Commander HUMES. This tie is one of those—this tie is still in its knotted state, as we examine it at this time. The portion of the tie around the neck has been severed apparently with scissors or other sharp instrument accounting for the loop about the neck.

The tie is tied in four-in-hand fashion but somewhat askew from the way a person would normally tie a four-in-hand knot.

Situated on the left anterior aspect of this knotted portion of the tie at a point approximately corresponding with the defects noted previously in the

two layers of the shirt is a superficial tear of the outer layer only of the fabric of this tie which, I believe, could have been caused by a glancing blow to this portion of the tie by a missile.

Mr. SPECTER. Mr. Chief Justice, I move at this time for the admission into evidence of Exhibits 393 through Exhibit 396, the three articles of clothing and the photograph which we have just used.

The CHAIRMAN. They may be admitted.

(Exhibits Nos. 393 through 396 were received in evidence and may be found in the Commission files.)

Mr. MCCLOY. Commander, did you say left or right?

Commander HUMES. No, sir. In fact, the way this bow is tied now it would appear to be on the left of this tie, but it is kind of twisted out of shape.

Mr. MCCLOY. Yes. It is twisted. It is not too clear.

Commander HUMES. It is not too clear, it is not clear how that might have been in position with the shirt, sir.

Mr. SPECTER. Now, Doctor Humes, at one point in your examination of the President, did you make an effort to probe the point of entry with your finger?

Commander HUMES. Yes, sir; I did.

Mr. SPECTER. And at or about that time when you were trying to ascertain, as you previously testified, whether there was any missile in the body of the President, did someone from the Secret Service call your attention to the fact that a bullet had been found on a stretcher at Parkland Hospital?

Commander HUMES. Yes, sir; they did.

Mr. SPECTER. And in that posture of your examination, having just learned of the presence of a bullet on a stretcher, did that call to your mind any tentative explanatory theory of the point of entry or exit of the bullet which you have described as entering at Point "C" on Exhibit 385?

Commander HUMES. Yes, sir. We were able to ascertain with absolute certainty that the bullet had passed by the apical portion of the right lung producing the injury which we mentioned.

I did not at that point have the information from Doctor Perry about the wound in the anterior neck, and while that was a possible explanation for the point of exit, we also had to consider the possibility that the missile in some rather inexplicable fashion had been stopped in its path through the President's body and, in fact, then had fallen from the body onto the stretcher.

Mr. SPECTER. And what theory did you think possible, at that juncture, to explain the passing of the bullet back out the point of entry; or had you been provided with the fact that external heart massage had been performed on the President?

Commander HUMES. Yes, sir; we had, and we considered the possibility that some of the physical maneuvering performed by the doctors might have in some way caused this event to take place.

Mr. SPECTER. Now, have you since discounted that possibility, Doctor Humes?

Commander HUMES. Yes; in essence we have. When examining the wounds in the base of the President's neck anteriorly, the region of the tracheotomy performed at Parkland Hospital, we noted, and we noted in our record, some contusion and bruising of the muscles of the neck of the President. We noted that at the time of the postmortem examination.

Now, we also made note of the types of wounds which I mentioned to you before in this testimony on the chest which were going to be used by the doctors there to place chest tubes. They also made other wounds, one on the left arm, and a wound on the ankle of the President with the idea of administering intravenous blood and other fluids in hope of replacing the blood which the President had lost from his extensive wounds.

Those wounds showed no evidence of bruising or contusion or physical violence, which made us reach the conclusion that they were performed during the agonal moments of the late president, and when the circulation was, in essence, very seriously embarrassed, if not nonfunctional. So that these wounds, the wound of the chest and the wound of the arm and of the ankle were performed about the same time as the tracheotomy wound because only a very few moments of time elapsed when all this was going on.

So, therefore, we reached the conclusion that the damage to these muscles on the anterior neck just below this wound were received at approximately the same time that the wound here on the top of the pleural cavity was, while the President still lived and while his heart and lungs were operating in such a fashion to permit him to have a bruise in the vicinity, because that he did have in these strap muscles in the neck, but he didn't have in the areas of the other incisions that were made at Parkland Hospital. So we feel that, had this missile not made its path in that fashion, the wound made by Doctor Perry in the neck would not have been able to produce, wouldn't have been able to produce, these contusions of the musculature of the neck.

Mr. DULLES. Could I ask a question about the missile, I am a little bit—the bullet, I am a little bit—confused. It was found on the stretcher. Did the President's body remain on the stretcher while it was in the hospital?

Commander HUMES. Of that point I have no knowledge. The only——

Mr. DULLES. Why would it—would this operating have anything to do with the bullet being on the stretcher unless the President's body remained on the stretcher after he was taken into the hospital; is that possible?

Commander HUMES. It is quite possible, sir.

Mr. DULLES. Otherwise it seems to me the bullet would have to have been ejected from the body before he was taken or put on the bed in the hospital.

Commander HUMES. Right, sir. I, of course, was not there. I don't know how he was handled in the hospital, in what conveyance. I do know he was on his back during the period of his stay in the hospital; Doctor Perry told me that.

Mr. DULLES. Yes; and wasn't turned over.

Commander HUMES. That is right.

Mr. DULLES. So he might have been on the stretcher the whole time, is that your view?

The CHAIRMAN. He said he had no view. He wasn't there, he doesn't know anything about it.

Mr. DULLES. Yes. I wonder if there is other evidence of this.

Mr. SPECTER. There has been other evidence, Mr. Dulles. If I may say at this point, we shall produce later, subject to sequential proof, evidence that the stretcher on which this bullet was found was the stretcher of Governor Connally. We have a sequence of events on the transmission of that stretcher which ties that down reasonably closely, so that on the night of the autopsy itself, as the information I have been developing indicates, the thought preliminarily was that was from President Kennedy's stretcher, and that is what led to the hypothesis which we have been exploring about, but which has since been rejected. But at any rate the evidence will show that it was from Governor Connally's stretcher that the bullet was found.

Mr. DULLES. So this bullet is still missing?

Mr. SPECTER. That is the subject of some theories I am about to get into. That is an elusive subject, but Dr. Humes has some views on it, and we might just as well go into those now.

Mr. MCCLOY. Before he gets into that, may I ask a question?

The CHAIRMAN. Surely, go right ahead.

Mr. MCCLOY. Quite apart from the President's clothing, now directing your attention to the flight of the bullet, quite apart from the evidence given by the President's clothing, you, I believe, indicated that the flight of the bullet was from the back, from above and behind. It took roughly the line which is shown on your Exhibit 385.

Commander HUMES. Yes, sir.

Mr. MCCLOY. I am not clear what induced you to come to that conclusion if you couldn't find the actual exit wound by reason of the tracheotomy.

Commander HUMES. The report which we have submitted, sir, represents our thinking within the 24–48 hours of the death of the President, all facts taken into account of the situation.

The wound in the anterior portion of the lower neck is physically lower than the point of entrance posteriorly, sir.

Mr. MCCLOY. That is what I wanted to bring out.

Commander HUMES. Yes, sir.

Mr. McCLOY. May I ask this: In spite of the incision made by the tracheotomy, was there any evidence left of the exit aperture?

Commander HUMES. Unfortunately not that we could ascertain, sir.

Mr. McCLOY. I see.

Mr. DULLES. There is no evidence in the coat or the shirt of an exit through the coat or shirt.

Commander HUMES. There is no exit through the coat, sir. But these two, in the shirt, of course—excuse me, sir—there is. The entrance by our calculations—

Mr. DULLES. The entrance I know.

Commander HUMES. Posteriorly.

Mr. DULLES. What about the exit?

Commander HUMES. The exit wounds are just below.

Mr. DULLES. But there was no coat to exit through.

Commander HUMES. No; anteriorly the coat was quite open.

Senator COOPER. May I ask a question?

Commander HUMES. Yes, sir, Senator.

Senator COOPER. Assuming that we draw a straight line from Point "C" which you have described as a possible point of entry of the missile, to Point "D" where you saw an incision of the tracheotomy——

Commander HUMES. Yes, sir.

Senator COOPER. What would be the relation of the bruise at the apex of the pleural sac to such a line?

Commander HUMES. It would be exactly in line with such a line, sir, exactly.

Senator COOPER. What was the character of the bruise that you saw there?

Commander HUMES. The bruise here, photographs are far superior to my humble verbal description, but if I let my hand in cup shaped fashion represent the apical parietal pleura, it was an area approximately 5 cm. in greatest diameter of purplish blue discoloration of the parietal pleura. Corresponding exactly with it, with the lung sitting below it, was a roughly pyramid-shaped bruise with its base toward the surface of the upper portion of the lung, and the apex down into the lung tissue, and the whole thing measured about 5 cm., which is a little—2 inches in extent, sir.

Senator COOPER. What would be the—can you describe the covering around the apex of the pleural sac, the nature of its protection. My point is to get your opinion as to whether some other factor, some factor other than the missile could have caused this bruise which you saw.

Commander HUMES. A couple of ways we might do this, sir. One with regard to temporal, it was quite fresh. When examined under the microscope, the lung in this area had recent hemorrhaging in it. The red blood cells were well-preserved, as they would be if it happened quite recently before death, as was the red blood cells where they had gotten out into the lung tissue near there.

The discoloration was essentially of the same character as the discoloration in the muscles adjacent thereto, which would roughly again place it temporally in approximately the same time since bruises change color as time goes by, and these appeared quite fresh.

This is with regard to time—I don't know whether that is the right parameter in which you wished to study it, Senator.

Senator COOPER. My question really went to this point: Considering the location of the bruise at the apex of the pleural sac——

Commander HUMES. Yes, sir.

Senator COOPER. And of the tissue or muscles around it, was there any other factor which you could think of that might have caused that bruise other than the passage of a missile?

Commander HUMES. It was so well localized that I truthfully, sir, can't think of any other way.

Senator COOPER. That is all.

Mr. McCLOY. May I ask you one question which, perhaps, the answer is quite obvious. If, contrary to the evidence that we have here, that anterior wound was the wound of entry, the shot must have come from below the President to have followed that path.

Commander HUMES. That course, that is correct, sir.

Mr. SPECTER. Dr. Humes, can you compare the angles of declination on 385, point "C" to "D", with 388 "A" to "B"?

Commander HUMES. You will note, and again I must apologize for the schematic nature of these diagrams drawn to a certain extent from memory and to a certain extent from the written record, it would appear that the angle of declination is somewhat sharper in the head wound, 388, than it is in 385.

The reason for this, we feel, by the pattern of the entrance wound at 388 "A" causes us to feel that the President's head was bent forward, and we feel this accounts for the difference in the angle, plus undoubtedly the wounds were not received absolutely simultaneously, so that the vehicle in which the President was traveling moved during this period of time, which would account for a difference in the line of flight, sir.

Mr. SPECTER. Aside from the slight differences which are notable by observing those two exhibits, are they roughly comparable to the angle of decline?

Commander HUMES. I believe them to be roughly comparable, sir.

Mr. SPECTER. Could you state for the record an approximation of the angle of decline?

Commander HUMES. Mathematics is not my forte. Approximately 45 degrees from the horizontal.

Mr. SPECTER. Would you elaborate somewhat, Doctor Humes, on why the angle would change by virtue of a tilting of the head of the President since the basis of the computation of angle is with respect to the ground?

Commander HUMES. I find the question a little difficult of answering right off, forgive me, sir.

Mr. SPECTER. I will try to rephrase it. Stated more simply, why would the tilting of the President's head affect the angle of the decline? You stated that was——

Commander HUMES. The angle that I am making an observation most about is the angle made that we envisioned having been made by the impingement of the bullet in its flight at the point of entry. This angle we see by the difference of the measurement of the two wounds.

Therefore, this is—we have several angles we are talking about here, unfortunately, this is—the angle of which we speak in this location, "A" to "B", and it is difficult.

I have to retract. Since we feel from their physical configurations, wounds 385 "C" and 388 "A" are entrance wounds, if there wasn't some significant change in the angulation of the President's head with respect to the line of flight from these missiles, the physical measurements of 385 "C" and this 388 "A" should be similar. They aren't, in fact, dissimilar in that there is a greater angulation in 388 "A". Therefore, there has to be either a change in the position of the vehicle in which the President is riding with respect to the horizontal or a change in the situation of the President's head. I believe that the exhibits submitted earlier, the photograph——

Mr. SPECTER. I believe the ones were given to you so far—excuse me, you are right, 389.

Commander HUMES. 389, in fact at this point shows the President's head in a slightly inclined forward position, and I am not enough aware of the geography of the ground over which the vehicle was traveling to know how much that would affect it.

Mr. SPECTER. If you were to be told that there was a distance traversed of approximately 150 feet from the time of Point "C" on 385 to Point "A" on 388, and you would assume the additional factor that there was a slight angle of decline on the street as well, would those factors, assuming them to be true, help in the explanation of the differences in the angles?

Commander HUMES. I think that they would make the figure as depicted in 388 quite understandably different from 385.

Mr. DULLES. Was it possible, in view of the condition of the brain to point with absolute accuracy to the point of exit there? I can see that the point of exit in 385 can be clearly determined. Is it equally possible to determine the point of exit in 388?

Commander HUMES. No, sir; it was not, other than through this large defect because when——

Mr. DULLES. Therefore, that angle might be somewhat different.

Commander HUMES. Might be somewhat different, sir. I think we made reference to that somewhat earlier. The fragments were so difficult to replace in their precise anatomic location——

Mr. DULLES. That is what I thought, but I wasn't sure.

Commander HUMES. That is correct.

Mr. MCCLOY. I would like to ask a question in regard to 385 similar to that I asked as to 388. In your opinion, was the 385 wound lethal?

Commander HUMES. No, sir.

Mr. DULLES. With the wound in 385, would it have affected the President's power of speech?

Commander HUMES. It could have, sir. The wound caused a defect in his trachea which would most usually have caused at least some defect in the proper phonation, sir.

(Discussion off the record.)

The CHAIRMAN. On the record.

Mr. SPECTER. In response to Mr. Dulles' question a moment ago, Doctor Humes, you commented that they did not turn him over at Parkland. Will you state for the record what the source of your information is on that?

Commander HUMES. Yes. This is a result of a personal telephone conversation between myself and Dr. Malcolm Perry early in the morning of Saturday, November 23.

Mr. SPECTER. At that time did Doctor Perry tell you specifically, Doctor Humes, that the Parkland doctors had not observed the wound in the President's back?

Commander HUMES. He told me that the President was on his back from the time he was brought into the hospital until the time he left it, and that at no time was he turned from his back by the doctors.

Mr. SPECTER. And at the time of your conversation with Doctor Perry did you tell Doctor Perry anything of your observations or conclusions?

Commander HUMES. No, sir; I did not.

(A short recess was taken.)

The CHAIRMAN. Gentlemen, the Commission will be in order. We will continue with the examination.

Mr. SPECTER. Doctor Humes, as to points of entry on the body of the late President, how many were there in total?

Commander HUMES. Two, sir, as depicted in 385–C and 388–A.

Mr. SPECTER. And to points of exit, how many were there?

Commander HUMES. Two, sir, as depicted in 385–D and the vicinity of 388–B. I make the latter remark as was developed earlier, in that the size of the large defect in the skull was so great and the fragmentation was so complex that it was impossible to accurately pinpoint the exit of the missile in the head wound.

Mr. SPECTER. Now as to that last factor, would the X-rays be of material assistance to you in pinpointing the specific locale of the exit?

Commander HUMES. I do not believe so, sir. The only path that the X-rays show in any detail are of the minor fragments which passed from point A to point B.

Mr. SPECTER. Now that you have finished your major descriptions of the wounds, can you be any more specific in telling us in what way the availability of the x-rays would assist in further specifying the nature of the wounds?

Commander HUMES. I do not believe, sir, that the availability of the X-rays would materially assist the Commission.

Mr. SPECTER. How about the same question as to the pictures?

Commander HUMES. The pictures would show more accurately and in more detail the character of the wounds as depicted particularly in 385 and 386 and in 388–A. They would also perhaps give the Commissioners a better—better is not the best term, but a more graphic picture of the massive defect in 388.

Mr. SPECTER. Going back for a moment, Doctor Humes——

The CHAIRMAN. Before we get off that, may I ask you this, Commander: If we had the pictures here and you could look them over again and restate your opinion, would it cause you to change any of the testimony you have given here?

Commander HUMES. To the best of my recollection, Mr. Chief Justice, it would not.

The CHAIRMAN. Mr. McCloy.

Mr. MCCLOY. May I ask this question?

The CHAIRMAN. Go right ahead.

Mr. MCCLOY. Do you have any knowledge as to whether or not any photographs were taken in Dallas?

Commander HUMES. I have none, sir, no knowledge.

Mr. MCCLOY. No knowledge that any were taken?

Representative FORD. May I ask what size are the pictures to which you refer?

Commander HUMES. We exposed both black and white and color negatives, Congressman. They were exposed in the morgue during the examination. They were not developed. The kodachrome negatives when developed would be 405. They were in film carriers or cassettes, as were the black and white. Of course they could be magnified.

Representative FORD. Have those been examined by personnel at Bethesda?

Commander HUMES. No, sir. We exposed these negatives; we turned them over. Here I must ask the counsel again for advice—to the Secret Service.

Mr. SPECTER. Yes; it was the Secret Service.

Commander HUMES. They were turned over to the Secret Service in their cassettes unexposed, and I have not seen any of them since. This is the photographs. The X-rays were developed in our X-ray department on the spot that evening, because we had to see those right then as part of our examination, but the photographs were made for the record and for other purposes.

Representative FORD. But they had never been actually developed for viewing.

Commander HUMES. I do not know, sir.

Mr. SPECTER. Doctor Humes, back to the angles for just a moment.

Commander HUMES. Yes, sir.

Mr. SPECTER. Hypothesize or assume, if you will, that other evidence will show that the wound inflicted on Commission Exhibit 385 at point C occurred while the President was riding in the rear seat of his automobile approximately 100 feet from a point of origin in a six-floor building nearby, and assume further that the wound inflicted in 388 at point A occurred when the President was approximately 250 feet away from the same point.

With those assumptions in mind, there would be somewhat different angles of declination going from C to D on 385 and from A to B on 388.

Commander HUMES. I would expect there would.

Mr. SPECTER. You have already testified earlier today that you were unable to pinpoint with precision angle A to B on 388 because of the reconstruction of the scalp.

Now my question to you, in that elongated fashion, is from what you know and what you have described, are the angles, as you have expressed them to be in your opinion, consistent with a situation where the two wounds were inflicted at the angles and at the distances just described to you?

Commander HUMES. I believe they are consistent. I would state that the path outlined on 388–A to B is to a certain extent conjectural for the reasons given before.

Mr. SPECTER. Now, Doctor Humes, I hand you a group of documents which have been marked as Commission Exhibit No. 397 and ask you if you can identify what they are?

Commander HUMES. Yes, sir; these are various notes in long-hand, or copies rather, of various notes in long-hand made by myself, in part, during the performance of the examination of the late President, and in part after the examination when I was preparing to have a typewritten report made.

Mr. SPECTER. Are there also included there some notes that you made while you talked to Doctor Perry on the telephone?

Commander HUMES. Yes, sir; there are.

Mr. SPECTER. Are there any notes which you made at any time which are not included in this group of notes?

Commander HUMES. Yes, sir; there are.

Mr. SPECTER. And what do those consist of?

Commander HUMES. In privacy of my own home, early in the morning of Sunday, November 24th, I made a draft of this report which I later revised, and of which this represents the revision. That draft I personally burned in the fireplace of my recreation room.

Mr. SPECTER. May the record show that the Exhibit No. 397 is the identical document which has been previously identified as Commission No. 371 for our internal purposes.

Is the first sheet then in that group the notes you made when you talked to Doctor Perry?

Commander HUMES. That is correct, sir.

Mr. SPECTER. And do the next 15 sheets represent the rough draft which was later copied into the autopsy report which has been heretofore identified with an exhibit number?

Commander HUMES. That is correct, sir.

Mr. SPECTER. And what do the next two sheets represent?

Commander HUMES. The next two sheets are the notes actually made in the room in which the examination was taking place. I notice now that the handwriting in some instances is not my own, and it is either that of Commander Boswell or Colonel Finck.

Mr. SPECTER. And was that writing made at the same time that the autopsy report was undertaken; that is, did you review all of the markings on those papers and note them to be present when you completed the autopsy report?

Commander HUMES. Yes, sir. From the time of the completion of this examination until the submission of the written report following its preparation, all of the papers pertinent to this case were in my personal custody.

Mr. SPECTER. Have you now described all of the documents which were present in that 397, Exhibit No. 397?

Commander HUMES. Yes, sir; with the exception of the certification to the fact that I, in fact, detailed them in my custody, and a certification that I had destroyed certain preliminary draft notes.

Mr. SPECTER. And these represent all the notes except those you have already described which you destroyed?

Commander HUMES. That is correct, sir.

Mr. SPECTER. Now, just one point on the notes themselves. Page 14 of your rough draft, Doctor Humes, as to the point of origin, the notes show that there was a revision between your first draft and your final report.

Commander HUMES. Yes, sir.

Mr. SPECTER. Will you first of all read into the record the final conclusion reflected in your final report.

Commander HUMES. I would rather read it from the final report. The final report reads:

"The projectiles were fired from a point behind and somewhat above the level of the deceased."

Mr. SPECTER. And what did the first draft of that sentence as shown on page 14 of your rough draft state?

Commander HUMES. It stated as follows:

"The projectiles were fired from a point behind and somewhat above a horizontal line to the vertical position of the body at the moment of impact."

Mr. SPECTER. Now would you state the reason for making that modification between draft and final report, please?

Commander HUMES. This examination, as I have indicated, was performed by myself with my two associates. The notes which we have just admitted as an exhibit are in my own hand and are my opinion, was my opinion at that time, as to the best way to present the facts which we had gleaned during this period.

Before submitting it to the typist, I went over this with great care with my two associates. One or the other of them raised the point that perhaps this sentence would state more than what was absolutely fact based upon our observations, pointing out that we did not know precisely at that time in what position the body of the President was when the missiles struck, and that therefore we should be somewhat less specific and somewhat more circumspect than the way we stated it. When I considered this suggestion, I agreed that it would be better to change it as noted, and accordingly, I did so.

Mr. SPECTER. Mr. Chief Justice, I move now for the admission into evidence of Exhibit No. 397.

The CHAIRMAN. It may be admitted.

(The documents, previously marked Exhibit No. 397 for identification, were received in evidence.)

Mr. MCCLOY. May I ask one question about the notes? The notes that you made contemporaneously with your examination, you said you put those down and then you put some in later. How much later were the notes, within the best of your recollection of the final notes made, not the final report, but the final notes that you made in your own handwriting?

Commander HUMES. The examination was concluded approximately at 11 o'clock on the night of November 22. The final changes in the notes prior to the typing of the report were made, and I will have to give you the time because whatever time Mr. Oswald was shot, that is about when I finished. I was working in an office, and someone had a television on and came in and told me that Mr. Oswald had been shot, and that was around noon on Sunday, November 24th.

Mr. SPECTER. Mr. Chief Justice, I have now marked another photograph as the next exhibit number, Commission Exhibit 398. May I say to the Commission that this is a photograph which, subject to later proof, will show it to be taken immediately after the President was struck by the first bullet.

The CHAIRMAN. It may be marked.

(The photograph was marked Commission Exhibit No. 398 for identification.)

May I move for its admission into evidence at this time for this purpose?

The CHAIRMAN. It may be admitted.

(The photograph, previously marked Commission Exhibit No. 398 for identification, was received in evidence.)

Looking at Commission Exhibit 398, Doctor Humes, with that as a background, have you had an opportunity to review the medical reports on Governor Connally at Parkland Hospital in Commission Exhibit 392?

Commander HUMES. I have.

Mr. SPECTER. Have you noted the wounds which he sustained on his right wrist, that is, Governor Connally's right wrist?

Commander HUMES. Yes, sir; I have noted the report of it in these records.

Mr. SPECTER. What does the report show as to those wounds on the right wrist?

Commander HUMES. The report shows a wound of entrance on the dorsal aspect of the right wrist. Let's get the precise point here. The wound of entry is described as on the dorsal aspect of the right wrist above the junction of the distal fourth of the radius and the shaft. It was approximately two centimeters in length and rather oblique, with the loss of tissue, and some considerable contusions at the margins. There was a wound of exit along the volar surface of the wrist about two centimeters above the flexion crease of the wrist in the midline.

Mr. SPECTER. Doctor Humes, I show you a bullet which we have marked as Commission Exhibit No. 399, and may I say now that, subject to later proof, this is the missile which has been taken from the stretcher which the evidence now indicates was the stretcher occupied by Governor Connally.

I move for its admission into evidence at this time.

The CHAIRMAN. It may be admitted.

(The article, previously marked Commission Exhibit No. 399 for identification, was received in evidence.)

Mr. SPECTER. We have been asked by the FBI that the missile not be handled by anybody because it is undergoing further ballistic tests, and it now appears, may the record show, in a plastic case in a cotton background.

Now looking at that bullet, Exhibit 399, Doctor Humes, could that bullet have gone through or been any part of the fragment passing through President Kennedy's head in Exhibit No. 388?

Commander HUMES. I do not believe so, sir.

Mr. SPECTER. And could that missile have made the wound on Governor Connally's right wrist?

Commander HUMES. I think that that is most unlikely. May I expand on those two answers?

Mr. SPECTER. Yes, please do.

Commander HUMES. The X-rays made of the wound in the head of the late President showed fragmentations of the missile. Some fragments we recovered and turned over, as has been previously noted. Also we have X-rays of the fragment of skull which was in the region of our opinion exit wound showing metallic fragments.

Also going to Exhibit 392, the report from Parkland Hospital, the following sentence referring to the examination of the wound of the wrist is found:

"Small bits of metal were encountered at various levels throughout the wound, and these were, wherever they were identified and could be picked up, picked up and submitted to the pathology department for identification and examination."

The reason I believe it most unlikely that this missile could have inflicted either of these wounds is that this missile is basically intact; its jacket appears to me to be in tact, and I do not understand how it could possibly have left fragments in either of these locations.

Mr. SPECTER. What wounds did Governor Connally sustain in his chest area, based upon the records of Parkland Hospital, which you have examined, Doctor Humes?

Commander HUMES. Governor Connally received in his chest a wound of entrance just—this is again from 392—"just lateral to the right scapula close to the axilla which had passed through the lattisimus dorsi muscle, shattered approximately ten centimeters of a lateral and anterior portion of the right fifth rib, and emerged below the right nipple anterially."

These were the wounds of the chest of Governor Connally.

Mr. SPECTER. Now assuming that there were only three missiles fired, and bearing in mind the positions of President Kennedy and Governor Connally from the photograph marked Commission Exhibit 398, do you have an opinion as to the source of the missiles which inflicted the wound on President Kennedy marked 385-C to D, and the wound in Governor Connally's chest which you have just referred to?

Commander HUMES. Yes. I would preface this statement by the following: As I testified earlier in the afternoon, as much as we could ascertain from our X-rays and physical examinations, this missile struck no bony structures in traversing the body of the late President. Therefore, I believe it was moving at its exit from the President's body at only very slightly less than that velocity, so it was still traveling at great speed.

I believe in looking at Exhibit 398, which purports to be at approximately the time the President was struck, I see that Governor Connally is sitting directly in front of the late President, and suggest the possibility that this missile, having traversed the low neck of the late President, in fact traversed the chest of Governor Connally.

Mr. SPECTER. How much of the velocity, if any, or would there be an appreciable diminution of the velocity of the projectile on passing through the portions of President Kennedy's body which you have described?

Commander HUMES. I would have to defer to my associate, Colonel Finck, for an opinion about this.

Mr. SPECTER. Fine. As to any damage to the rib which you described Governor Connally sustained, would that impact or trauma be consistent with the markings which are shown on Exhibit 399?

Commander HUMES. I think it quite possible. Here I think if this point were to be explored further, a most valuable piece of evidence would be an X-ray of the chest of Governor Connally, because I believe that this missile could have struck the rib a glancing blow.

The rib is a rather rigid structure, and the missile would not have to strike it directly to cause the fracture that was described, and the fracture is not very clearly described to me, and if an X-ray, for instance, showed no metallic fragments in the chest of the Governor, I would think it quite likely that this was the missile that had traversed his chest, because I doubt if this missile would have left behind it any metallic fragments from its physical appearance at this time.

Mr. SPECTER. Could that missile have traversed Governor Connally's chest without having him know it immediately or instantaneously?

Commander HUMES. I believe so. I have heard reports, and have been told by my professional associates of any number of instances where people received penetrating wounds in various portions of the body and have only the sensation of a slight discomfort or slight slap or some other minor difficulty from such a missile wound. I am sure he would be aware that something happened to him, but that he was shot, I am not certain.

Representative FORD. Would that have been the potential reaction of the President when first hit, as shown in 385?

Commander HUMES. It could very easily be one of some type of an injury—I mean the awareness that he had been struck by a missile, I don't know, but people have been drilled through with a missile and didn't know it.

Mr. SPECTER. Dr. Humes, under your opinion which you have just given us, what effect, if any, would that have on whether this bullet, 399, could have been the one to lodge in Governor Connally's thigh?

Commander HUMES. I think that extremely unlikely. The reports, again Exhibit 392 from Parkland, tell of an entrance wound on the lower midthigh of the Governor, and X-rays taken there are described as showing metallic fragments in the bone, which apparently by this report were not removed and are still present in Governor Connally's thigh. I can't conceive of where they came from this missile.

Representative FORD. The missile identified as Exhibit 399.

Commander HUMES. 399, sir.

Mr. SPECTER. Doctor Humes, would you have an opinion as to whether the wounds on Governor Connally's wrist and thigh were caused by the same bullet?

Commander HUMES. In reading the description of the fragmentation that was found, fragments were found in the wrist, one fragment was found imbedded in his femur, I would feel it was definitely within the realm of possibility that the same missile could have produced both of those injuries.

Mr. SPECTER. Those are all my questions, Mr. Chief Justice.

The CHAIRMAN. Are there any other questions? If not, thank you very much, Commander. You have been very helpful to us, indeed.

Commander HUMES. Thank you very much, sir.

The CHAIRMAN. Thank you.

Mr. SPECTER. Commander Boswell.

Mr. MCCLOY. May I ask one more question?

The CHAIRMAN. Of course you may.

Mr. MCCLOY. Earlier in the afternoon we had taken out of cellophane bags here the clothing of the President.

Commander HUMES. Yes, sir.

Mr. MCCLOY. And amongst them was the shirt.

Commander HUMES. Yes, sir.

Mr. MCCLOY. From your examination of the wounds, of the defects, I guess you would call it in the shirt——

Commander HUMES. Yes, sir.

Mr. MCCLOY. Would you from examining the tissues of that shirt have any conclusions as to how that wound, how that missile passed through the shirt? Was it from the rear to the front, or from the front to the rear?

Commander HUMES. As I examined that exhibit today, sir, the threads are fragmented and distorted in such a fashion which would indicate to me that the missile passed through the shirt from the rear to the front.

TESTIMONY OF COMDR. J. THORNTON BOSWELL, MEDICAL CORPS, U.S. NAVY

The CHAIRMAN. Commander Boswell, will you raise your right hand and be sworn, please?

Do you solemnly swear the testimony you give before this Commission will be the truth, the whole truth, and nothing but the truth, so help you God?

Commander BOSWELL. I do, sir.
The CHAIRMAN. Be seated, please.
Mr. SPECTER. Will you state your full name for the record, please?
Commander BOSWELL. J. Thornton Boswell, Commander, Medical Corps, U.S. Navy.
Mr. SPECTER. What is your profession?
Commander BOSWELL. Physician.
Mr. SPECTER. And where did you obtain your medical degree, please?
Commander BOSWELL. At the College of Medicine, Ohio State University.
Mr. SPECTER. And what experience have you had in your professional line subsequent to obtaining that degree?
Commander BOSWELL. I interned in the Navy and took my pathology training at St. Albans Naval Hospital in New York. I was certified by the American Board of Pathology in both clinical and pathological anatomy in 1957 and 1958.
Mr. SPECTER. And what is your duty assignment at the present time?
Commander BOSWELL. I am the Chief of Pathology at the National Naval Medical School.
Mr. SPECTER. Did you have occasion to participate in the autopsy of the late President Kennedy?
Commander BOSWELL. I did.
Mr. SPECTER. And did you assist Doctor Humes at that time?
Commander BOSWELL. Yes, sir.
Mr. SPECTER. Have you been present here today during the entire course of Doctor Humes' testimony?
Commander BOSWELL. I have, sir; yes.
Mr. SPECTER. Do you have anything that you would like to add by way of elaboration or modification to that which Doctor Humes has testified?
Commander BOSWELL. None, I believe. Doctor Humes has stated essentially what is the culmination of our examination and our subsequent conference, and everything is exactly as we had determined our conclusions.
Mr. SPECTER. And are you one of the three coauthors of the autopsy report which has been previously identified as a Commission Exhibit?
Commander BOSWELL. Yes; I am.
Mr. SPECTER. All the facts set forth therein are correct in accordance with your analysis and evaluation of the situation?
Commander BOSWELL. Yes.
Mr. SPECTER. And specifically, as to the points of entry and points of exit which have been testified to by Doctor Humes, do his views express yours as well?
Commander BOSWELL. They do, yes.
Mr. SPECTER. Doctor Boswell, would you state for the record what your conclusion was as to the cause of death of President Kennedy?
Commander BOSWELL. The brain injury was the cause of death.
Mr. SPECTER. And in the absence of brain injury, what, in your view, would have been the future status of President Kennedy's mortality, if he had only sustained the wound inflicted in 385?
Commander BOSWELL. I believe it would have been essentially an uneventful recovery. It could have been easily repaired, and I think it would have been of little consequence.
Mr. SPECTER. Those are my only questions, Mr. Chief Justice.
The CHAIRMAN. Does anyone have any questions of the Commander? If not, Commander, thank you very much, indeed. You have been very helpful to us.
Mr. SPECTER. Colonel Finck.

TESTIMONY OF LT. COL. PIERRE A. FINCK, PHYSICIAN, U. S. ARMY

The CHAIRMAN. Colonel Finck.
Colonel, will you raise your right hand and be sworn? Do you solemnly swear that the testimony you give before this Commission will be the truth, the whole truth, and nothing but the truth, so help you God?

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Colonel FINCK. I do.

The CHAIRMAN. Will you be seated, please, Colonel?

Mr. SPECTER. Would you state your full name for the record, please?

Colonel FINCK. My first name is Pierre. My middle initial is "A". My last name is Finck.

Mr. SPECTER. What is your profession, sir?

Colonel FINCK. I am a physician.

Mr. SPECTER. And by whom are you employed?

Colonel FINCK. By the United States Army.

Mr. SPECTER. And what is your rank?

Colonel FINCK. I am a lieutenant colonel in the Medical Corps.

Mr. SPECTER. Where did you obtain your medical degree?

Colonel FINCK. At the University of Geneva Medical School in Switzerland.

Mr. SPECTER. And in what year did you obtain that degree?

Colonel FINCK. In 1948.

Mr. SPECTER. What has your experience been in the medical profession subsequent to obtaining that degree?

Colonel FINCK. I had 4 years of training in pathology after my internship, ~~4 years~~, including 2 years of pathology at the University Institute of Pathology in Geneva, Switzerland, and 2 years at the University of Tennessee Institute of Pathology in Memphis, Tenn.

Mr. SPECTER. And how long have you been in the United States Army?

Colonel FINCK. Since 1955.

Mr. SPECTER. And what have your duties consisted of in the Army?

Colonel FINCK. From 1955 to 1958 I performed approximately 200 autopsies, many of them pertaining to trauma including missile wounds, stationed at Frankfort, Germany as pathologist of the United States Army Hospital in Frankfurt, Germany.

Mr. SPECTER. Have you had any additional, special training or experience in missile wounds?

Colonel FINCK. For the past 3 years I was Chief of the Wound Ballistics Pathology Branch of the Armed Forces Institute of Pathology and in that capacity I reviewed personally all the cases forwarded to us by the Armed Forces, and some civilian cases from the United States and our forces overseas. The number of these cases amounts to approximately 400 cases. I was called as a consultant in the field of missile wounds for this particular case, and also last year in February 1963, the Surgeon General of the Army sent me to Vietnam for a wound ballistics mission. I had to testify in a murder trial involving a 30/30 rifle in the first week of March this year, and I came back yesterday after one week in Panama where I had to testify. I was sent to Panama by the Secretary of the Army regarding the fatalities of the events of 9-~~10~~ 11 in January of 1964.

Mr. SPECTER. Have you been certified by the American Board of Pathology, Doctor Finck?

Colonel FINCK. I was certified in pathology anatomy by the American Board of Pathology in 1956, and by the same American Board of Pathology in the field of forensic pathology in 1961.

Mr. SPECTER. Would you describe briefly for the Commission what forensic pathology involves?

Colonel FINCK. Forensic pathology is the study with the naked eye and with the microscope of injuries, including missile wounds, trauma in general. In summary, it is the part of pathology in relation to the law, violent death being homicide, be it suicide, accidental or undetermined. It also includes unexplained deaths, sudden deaths, and poisoning.

Mr. SPECTER. Did you have occasion to participate in the autopsy of the late President Kennedy?

Colonel FINCK. Yes; I did.

Mr. SPECTER. And are you one of the three coauthors of the autopsy report which has been previously marked and introduced into evidence here?

Colonel FINCK. Yes, I am.

Mr. SPECTER. Have you had occasion to conduct any experiments on the effect of missile penetration of the brain reflected in the chart which you have brought with you here today?

Colonel FINCK. No, sir.

Mr. SPECTER. Of the skull—let me phrase the question this way: What does the test which is depicted on the document before you relate to?

Colonel FINCK. It is based on my observations, not on experiments.

Mr. SPECTER. Would you pass that to me, sir, so that I may mark that as a Commission Exhibit, and then I will ask you to identify it, please?

Mr. Chief Justice, may I mark as Commission Exhibit No. 400 a document?

The CHAIRMAN. It may be marked.

(The document was marked Commission Exhibit No. 400 for identification.)

Mr. SPECTER. I will ask Doctor Finck to describe it for us, please.

Colonel FINCK. This is a scheme which I prepared before the 22d of November. It is a teaching scheme, but it applies to the case in discussion. It will be of help in understanding how I could identify the entrance and the exit by examination of bone. "A" represents the bony portion of the skull. "B" represents the cavity of the head, the cranial cavity. "C" represents the entrance and "D" represents the exit. The arrows indicate the missile path.

This scheme is based upon observation of through and through wounds of bone, and the same differences apply to a pane of glass. The surface struck first by the missile in relation to the surface struck next by the missile, this one, shows a smaller diameter, which means that if you look at the ~~route~~ of entrance in this case here, C, from the outside you will not see a crater. If you examine it from the inside, you will see a crater corresponding to the bevelling, coning, shelving, previously described by Commander Humes.

In the case we are discussing today, it was possible to have enough curvature and enough portion of the crater to identify positively the wound of entrance at the site of the bone.

Mr. SPECTER. Relating then your evaluation of the situation with respect to President Kennedy, and turning to Commission Exhibit No. 388, what is your opinion as to whether point A is a wound of entrance or exit?

Colonel FINCK. My opinion as regards Exhibit 388, letter A, is that this wound is the wound of entrance.

Mr. SPECTER. And what are the characteristics of that wound which lead you to that conclusion?

Colonel FINCK. The characteristics were that seen from the inside of the skull, I could see a beveling in the bone, a beveling that could not be seen when the wound was seen from outside the skull.

Mr. SPECTER. Are there any other individual characteristics that led you to conclude A was the wound of entrance?

Colonel FINCK. No.

Mr. SPECTER. Were you present when the three pieces of scalp were reconstructed to form the major portion of the absent part of President Kennedy's skull which Doctor Humes described?

Colonel FINCK. I was present when several portions of bone were brought.

Mr. SPECTER. And what did you observe, if anything, as to a reconstructed hole from those three portions of skull?

Colonel FINCK. May I refer to my scheme?

Mr. SPECTER. Please do.

Colonel FINCK. For the sake of demonstration.

Mr. SPECTER. Fine.

Colonel FINCK. At the level of the wound of exit, ~~E~~ D, in my scheme, Commission Exhibit No. 400, when viewed from the inside of the skull, there was no crater, whereas when the wound is seen from the outside of the skull, there was beveling, cratering, or coning—this is possible to determine an exit even if only a portion of the bone is submitted, for the reason that if there was enough bone submitted, there is enough curvature to identify the inside and outside of the skull. Therefore the fragment, to give you an example, this portion at the level of the wound of exit can be oriented, and the outer surface of the skull and the inner surface of the skull may be identified due to the curvature.

And then you look at the direction of the beveling and you do see the beveling

when looking from the outside and you can identify an exit wound. And that is what I did, and now I am referring to the actual case in discussion, Commission Exhibit 388.

Mr. SPECTER. That is B?

Colonel FINCK. Letter B. We will see portions of bone in this general area, the large wound in the bone on the right side of the skull of President Kennedy. I had enough curvature to identify outside of the skull, and inside of the skull, as the first step to orient the specimen, and then I could determine the location of the beveling, and I could therefore say that B, Commission Exhibit 388, is a wound of exit.

Mr. SPECTER. Based on your observations and conclusions, was President Kennedy shot from the front, rear, side or what?

Colonel FINCK. President Kennedy was, in my opinion, shot from the rear. The bullet entered in the back of the head and went out on the right side of his skull, producing a large wound, the greatest dimension of which was approximately 13 centimeters.

Mr. SPECTER. And as to angle, was he shot from below, from level, from above, or what, in your opinion?

Colonel FINCK. In my opinion, the angle can be determined only approximately due to the fact that the wound of entrance is fairly small and could give enough precision in the determination of the path, but the dimension of the wound of exit, letter B of Exhibit 388, is so large that we can only give an approximate angle. In my opinion, the angle was within 45 degrees from the horizontal plane.

Mr. SPECTER. Is that to say that there was a 45-degree angle of declination from the point of origin to the point of impact, from the point of origin of the bullet where the bullet came from a gun until the point where it struck President Kennedy?

The CHAIRMAN. In other words, you mean was he shot from above or below.

Mr. SPECTER. Yes.

Colonel FINCK. I think I can only state, sir, that he was shot from above and behind.

Mr. SPECTER. At this time I move for admission into evidence Exhibit 400, Mr. Chief Justice.

The CHAIRMAN. It may be admitted.

(The document was marked Commission Exhibit No. 400 for identification, and was received in evidence.)

Mr. SPECTER. As to Exhibit 385, Dr. Finck, was point C a point of entry or a point of exit, in your opinion?

Colonel FINCK. In my opinion point C of Commission's Exhibit 385 is a wound of entrance.

Mr. SPECTER. And what is the basis for that conclusion?

Colonel FINCK. The basis for that conclusion is that this wound was relatively small with clean edges. It was not a jagged wound, and that is what we see in wound of entrance at a long range.

Mr. SPECTER. Were you present here today and did you hear the entire testimony of Doctor Humes?

Colonel FINCK. Yes; I did.

Mr. SPECTER. And do you concur in Dr. Humes' statements and opinions regarding the point of entry C, point of exit D, and general angle on the flight of the missile?

Colonel FINCK. I certainly do.

Mr. SPECTER. Then from what direction was President Kennedy shot on entry point C?

Colonel FINCK. From behind and above.

Mr. SPECTER. Were the bullets used dumdum bullets, in your opinion, Dr. Finck?

Colonel FINCK. In what wound, sir?

Mr. SPECTER. Well, start with the head wound, or the back wound, either one.

Colonel FINCK. In all the wounds considered, on the basis of the aspect of the wound of entrance, dumdum bullets were not used.

Mr. SPECTER. And what characteristics of dumdum bullets were absent, in your opinion—in your evaluation of these wounds?

Colonel FINCK. I would expect more jagged, more irregular and larger wounds of entrance than described in this case.

Representative FORD. With a dumdum bullet?

Colonel FINCK. With a dumdum bullet.

Mr. SPECTER. With respect to the question of likelihood of Governor Connally having been wounded in the back and chest with the same bullet which passed through President Kennedy in 385, what reduction would there be, if any, in the velocity, considering the relative positions of the two men in the automobile as reflected in photograph, Exhibit 398?

Colonel FINCK. Of course, to reach precise figures we would need experiments and similar circumstances with the same type ammunition at the same distance through two human cadavers, which I did not do.

On the basis that if we assume that this is one bullet going through President Kennedy's body and also through Governor Connally's body, the reduction of velocity would be of some extent after passing through President Kennedy's body, but not having hit bones, the reduction in velocity, after going through President Kennedy's body, would be minimal.

Mr. SPECTER. Would there be sufficient force then to inflict the wound which Dr. Humes described from the Parkland Hospital records as having been inflicted on Governor Connally's back and chest?

Colonel FINCK. There would be enough energy to go through the body of the Governor.

Mr. SPECTER. In expressing your opinion on that subject, Doctor Finck, have you taken into account the assumptions on distance, that we are dealing here with a weapon that has a muzzle velocity in the neighborhood of slightly in excess of 2,000, and that the vehicle carrying these two individuals was approximately 150, about 150 feet away from the site of origin of the missile?

Colonel FINCK. At this range, a bullet of this velocity loses very little velocity, and keeps upon impact a large amount of kinetic energy.

Mr. SPECTER. You heard the whole of Doctor Humes' testimony, did you not?

Colonel FINCK. Yes; I did.

Mr. SPECTER. Do you have anything that you would like to add to what he said?

Colonel FINCK. No.

Mr. SPECTER. Or would you like to modify his testimony in any way?

Colonel FINCK. No.

Mr. SPECTER. Do you subscribe to the observations and procedures which he outlined during the course of his testimony?

Colonel FINCK. I do.

Mr. SPECTER. As having been conducted on President Kennedy?

Colonel FINCK. I do.

Mr. SPECTER. And do you share the opinions which he expressed in their entirety in the course of his testimony here today?

Colonel FINCK. I do.

The CHAIRMAN. You might be seated, Colonel.

Mr. MCCLOY. Just as truthful seated as standing.

Representative FORD. How many cases did you investigate to develop this theory shown by Commission Exhibit 400?

Colonel FINCK. Among the more than 400 cases I have reviewed, several of them—I cannot give you an exact figure, I do not tabulate them, but many of them had through and through wounds of the skull as well as of flat bones, as, for instance, the sternum, the bone we have in front of our chest, and this would apply also to a through and through wound of the sternum. I have cases like that.

There was a specific case in which I was able to identify the entrance at the level of the sternum on the same basis as the criteria I have given for the skull. Whenever a bullet goes through a flat bone, it will produce that beveling, that cratering, shelving, and that I have seen in numerous cases.

Representative FORD. Is this a generally accepted theory in the medical profession?

Colonel FINCK. Yes, sir; it is. Am I allowed to quote a standard textbook?

The CHAIRMAN. You may; yes sir.

Colonel FINCK. The textbook of legal medicine, pathology and toxicology by Gonzalez, Vance, Hâlpern and Umberger does not give a scheme like I have shown to you today, but describes similar criteria.

As you know, one of the authors of the book I mentioned is still chief medical examiner of New York City, with 20,000 medical-examiner cases a year.

Mr. SPECTER. Doctor Finck, after the path C–D described in No. 385, would that be a straight line starting with the weapon itself, or was that line deviated in any way or altered when it passed through the body of President Kennedy?

Colonel FINCK. For practical purposes line C–D is a straight line with little or no deviation, the bullet not having hit bony structures.

Mr. SPECTER. Dr. Finck, have you had an opportunity to examine Commission's Exhibit 399?

Colonel FINCK. For the first time this afternoon, sir.

Mr. SPECTER. And based upon your examination of that bullet, do you have an opinion as to whether in its current condition it could have passed through President Kennedy at point C–D in 385 and then inflicted the wound in the back and chest of Governor Connally?

Colonel FINCK. Yes; I do. This is a bullet showing marks indicating the bullet was fired. The second point is that there was practically no loss of this bullet. It kept its original caliber and dimensions. There was no evidence that any major portion of the jacket was lost, and I consider this as one bullet which possibly could have gone through the wounds you described.

Mr. SPECTER. And could that bullet possibly have gone through President Kennedy in 388?

Colonel FINCK. Through President Kennedy's head? 388?

Mr. SPECTER. And remained intact in the way you see it now?

Colonel FINCK. Definitely not.

Mr. SPECTER. And could it have been the bullet which inflicted the wound on Governor Connally's right wrist?

Colonel FINCK. No; for the reason that there are too many fragments described in that wrist.

Mr. SPECTER. And is the condition of Exhibit 399 consistent with the type of a wound which Doctor Humes described on Governor Connally's rib?

Colonel FINCK. Yes.

Mr. MCCLOY. I have a question.

The CHAIRMAN. Go right ahead.

Mr. MCCLOY. From your examination of Exhibit 399, can you identify the caliber of that bullet?

Colonel FINCK. The caliber of this bullet, if I could measure it, but I cannot touch it.

The CHAIRMAN. We can.

Colonel FINCK. I would say it is consistent with a 6.5 mm.

Mr. MCCLOY. Are you familiar with the Mannlicher 6.5 rifle?

Colonel FINCK. I am familiar with the caliber 6.5. I can draw the calibers for you on the blackboard.

Mr. MCCLOY. What is the initial velocity of a 6.5 mm. bullet of that character?

Colonel FINCK. Of the order of 2,000 feet per second.

Mr. MCCLOY. And you say there would not be a substantial diminution of that velocity either at the point of impact or at the point of exit?

Colonel FINCK. That is correct.

Mr. SPECTER. One more question, Mr. Chief Justice.

On 388, point A to B, what is your view, Dr. Finck, as to whether or not that is represented by a straight line going back to the point of origin of the weapon?

Colonel FINCK. The difficulty in interpreting the path in line A–B of Commission's Exhibit 388 is that, one, there is, as stated before, a large wound of exit, and, two, there is a secondary path as indicated by the fragments recovered. So we can have an assumption and state that the general direction, the general path, the general angle of this missile was from behind and above, and that the bullet, markedly fragmented, went out of the President's head

on the right side, but that a portion of this bullet which badly fragmented was recovered within the skull.

Mr. SPECTER. In view of the impact on the skull at point A, it is unlikely to be a straight line to B all the way back to the muzzle of the weapon as it is, say, in 385 C–D, all the way back to the muzzle of the gun.

Colonel FINCK. In C–D, Commission's Exhibit 385, due to the fact that there was no fragmentation, I can say that it is a straight line from behind and above, whereas here, due to the fragmentation and to the dual path, I can't give a precise angle, but I can say that the injury is consistent with a wound produced by one bullet producing many fragments.

The CHAIRMAN. Senator, have you any questions you want to ask?

Mr. MCCLOY. May I ask one?

The CHAIRMAN. Yes; go right ahead.

Mr. MCCLOY. Did you examine any of the fragments which were removed from the President's skull?

Colonel FINCK. I only saw one fragment shown to me when I arrived at Bethesda, and it was an elongated black metallic fragment, and that is the only one I saw to my recollection. I was told that it had been removed from the brain of President Kennedy in the anterior portion of his head.

Mr. MCCLOY. From that bullet, that fragment, could you determine, was it sufficiently large to determine from the ballistic evidence the caliber of the bullet?

Colonel FINCK. No, sir; for the reason that to determine the caliber you need the entire bullet, or at least an entire portion. You need a portion of the bullet showing the entire diameter, and I was not shown that. I was shown a fragment which represented a very small portion of the original bullet. Therefore, at that time I could not say anything on the possible original caliber.

Mr. MCCLOY. You examined no fragment which did contain those characteristics?

Colonel FINCK. No, sir; I did not see any entire bullet or portion of bullet showing the entire diameter.

The CHAIRMAN. Congressman Ford?

Representative FORD. I believe you testified, Colonel, that you concurred in the previous testimony by Commander Humes and Commander Boswell, and that you were one of the co-authors of the autopsy. At any time during this process where you were conducting the autopsy, was there any disagreement between any one of you three, any difference of opinion as to anything involved in the autopsy?

Colonel FINCK. No, sir.

Representative FORD. There has been complete unanimity on what you saw, what you did, and what you have reported?

Colonel FINCK. Yes, sir.

The CHAIRMAN. Senator Cooper?

Senator COOPER. Colonel, I would like for you to look at Exhibit 388 and at the possible trajectory of the bullet which entered President Kennedy's head at A and then mark it as a possible point of exit by "out". You remember there was testimony about a portion of the bullet from point A to the place on the diagram marked "fragment" where a fragment was found. I would like to ask if it is possible that the trajectory of the bullet, from the point of origin, could have been A to this point marked "fragment" as well as from A to the place marked "out"?

Colonel FINCK. I don't think so, sir.

Senator COOPER. Why? Would you explain that answer?

Colonel FINCK. I ~~would~~ think that I would consider the midportion of this exit ~~would~~ labeled B, Exhibit 388, as the wound produced by most of the fragments and the major portions of the fragmenting bullet. This is only a small portion of it which makes me say that this is a secondary path.

Senator COOPER. What was the size of the fragment relative to the size of the missile of the 6.5 Mannlicher, fired from the 6.5 Mannlicher rifle?

Colonel FINCK. Approximately one-tenth, or even less.

Representative FORD. From your numerous case studies, is it typical for a

bullet, for a missile in this circumstance as shown in 388, to fragment to the degree that this one apparently did?

Colonel FINCK. Yes, it is quite common to find a wound of exit much larger than the wound of entrance for weapons commonly used.

Representative FORD. But is it typical for the missile to fragment to the degree that this one did as shown in Exhibit 388?

Colonel FINCK. Yes; it is.

Representative FORD. Is it typical to find only a limited number of fragments as you apparently did in this case?

Colonel FINCK. This depends to a great extent on the type of ammunition used. There are many types of bullets, jacketed, not-jacketed, pointed, ~~hollow-nosed~~, hollow-points, flatnose, roundnose, all these different shapes will have a different influence on the pattern of the wound and the degree of fragmentation.

Representative FORD. That is all.

The CHAIRMAN. Thank you, Colonel, very much for your help.

Colonel FINCK. You are welcome, sir.

Representative FORD. May I ask just one question?

The CHAIRMAN. Yes; Colonel, we would like to ask just one more question.

Representative FORD. Do these two wounds represent the same or a different kind of bullet?

Colonel FINCK. You are referring to one wound and this other wound here?

Representative FORD. I am referring to the wound shown in Exhibit 388 identified as point of entry A, and wound in Exhibit 385 identified as C.

Colonel FINCK. Due to the difference in the nature of the tissue, difference in the nature of the target, it is perfectly possible that these two wounds came from the same type of bullet, that one hit bony structures and the other one did not, and that explains the differences between the patterns of these two wounds.

Representative FORD. Why one fragmented and one did not.

Colonel FINCK. Yes.

(Discussion off the record.)

The CHAIRMAN. Gentlemen, again thank you very much.

(Whereupon, at 3:45 p.m., the President's Commission recessed.)

Wednesday, March 18, 1964

TESTIMONY OF MICHAEL R. PAINE AND RUTH HYDE PAINE

The President's Commission met at 9 a.m. on March 18, 1964, at 200 Maryland Avenue NE., Washington, D.C.

Present were Chief Justice Earl Warren, Chairman; Senator John Sherman Cooper, Representative Gerald R. Ford, John J. McCloy, and Allen W. Dulles, members.

Also present were J. Lee Rankin, general counsel; Wesley J. Liebeler, assistant counsel, Albert E. Jenner, Jr., assistant counsel; Dr. Alfred Goldberg, historian; and Charles Murray, observer.

TESTIMONY OF MICHAEL R. PAINE

The CHAIRMAN. The Commission will be in order.

Mr. Paine, I will just read a brief statement concerning the purpose of the meeting today which is our practice.

The purpose of this hearing is to take the testimony of Mr. and Mrs. Michael R. Paine. The Commission has been advised that Mr. and Mrs. Paine made the acquaintance of the Oswalds during 1963, and that Mrs. Marina Oswald lived in the Paine home from late September 1963 up to the time of the assassination.

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(Testimony and reference to testimony.)

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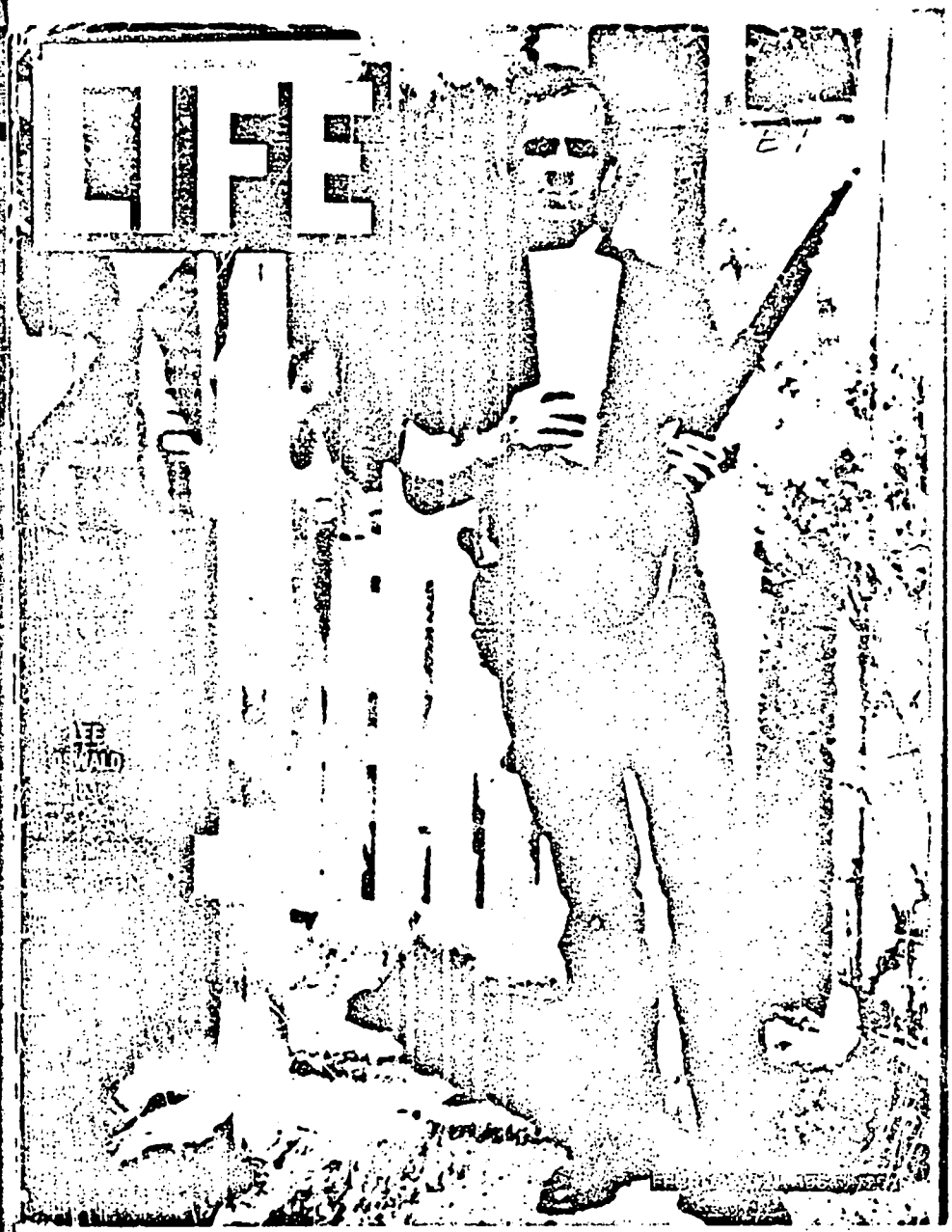
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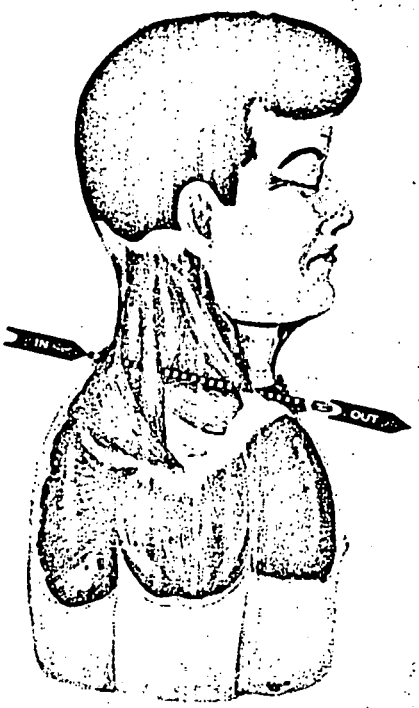
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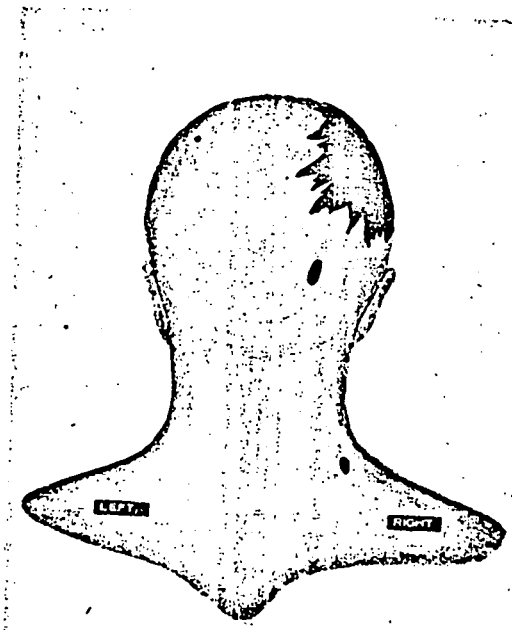
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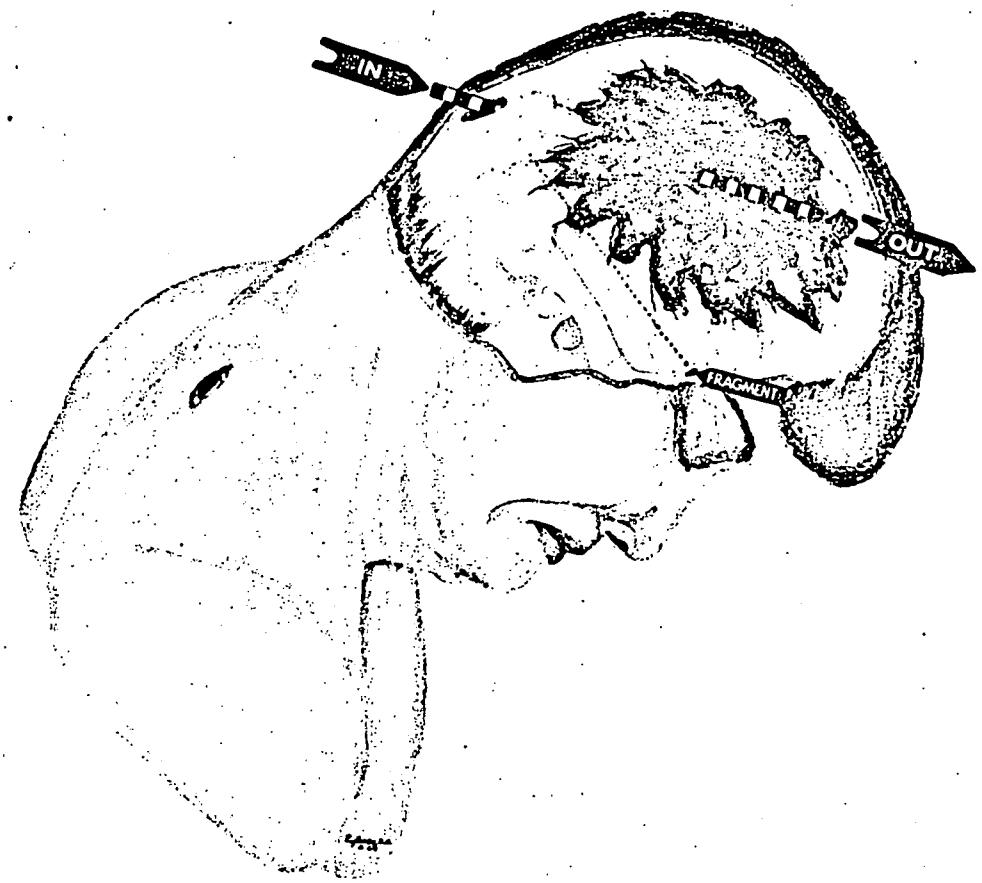
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Standard Form 503
Revised August 1964
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Circular A-83 (Rev.)

— Commission Exhibit No. 387

CLINICAL RECORD | **AUTOPSY PROTOCOL** A63-272 (JJH:ec)

DATE AND HOUR DIED	DATE AND HOUR AUTOPSY PERFORMED	CHECK ONE		
		FULL AUTOPSY	HEAD ONLY	TRUNK ONLY
22 November 1963 1300(CST)	22 November 1963 2000(EST)			
PROSECTOR (497831)	ASSISTANT (439378)			
CDR J. J. HUNES, MC, USN	CDR "J" THORNTON BOSWELL,MC,USN	X		
CLINICAL DIAGNOSES (Including operations)	LCOL PIERRE A. FINCK,MC,USA (04 043 322)			

Ht. - 72½ inches
Wt. - 170 pounds
Eyes - blue
Hair - Reddish brown

PATHOLOGICAL DIAGNOSES

CAUSE OF DEATH: Gunshot wound, head.

APPROVED SIGNATURE

MILITARY ORGANIZATION (If this required)	AGE	SEX	RACE	IDENTIFICATION NO.	AUTOPSY NO.
J. J. HUNES, CDR, MC, USN	46	Male	Cauc.		A63-272
PATIENT'S IDENTIFICATION (For typed or written entries give: Name—last, first, middle; grade; date; hospital or medical facility)				REGISTER NO.	WARD NO.

KENNEDY, JOHN F.
NAVAL MEDICAL SCHOOL

AUTOPSY PROTOCOL
Standard Form 503

HEAD COPY | HEAD COPY | HEAD COPY

978

VOLUME XVII

CLINICAL SUMMARY: According to available information the deceased, President John F. Kennedy, was riding in an open car in a motorcade during an official visit to Dallas, Texas on 22 November 1963. The President was sitting in the right rear seat with Mrs. Kennedy seated on the same seat to his left. Sitting directly in front of the President was Governor John B. Connolly of Texas and directly in front of Mrs. Kennedy sat Mrs. Connolly. The vehicle was moving at a slow rate of speed down an incline into an underpass that leads to a freeway route to the Dallas Trade Mart where the President was to deliver an address.

Three shots were heard and the President fell forward bleeding from the head. (Governor Connolly was seriously wounded by the same gunfire.) According to newspaper reports ("Washington Post" November 23, 1963) Bob Jackson, a Dallas "Times Herald" Photographer, said he looked around as he heard the shots and saw a rifle barrel disappearing into a window on an upper floor of the nearby Texas School Book Depository Building.

Shortly following the wounding of the two men the car was driven to Parkland Hospital in Dallas. In the emergency room of that hospital the President was attended by Dr. Malcolm Perry. Telephone communication with Dr. Perry on November 23, 1963 develops the following information relative to the observations made by Dr. Perry and procedures performed there prior to death.

Dr. Perry noted the massive wound of the head and a second much smaller wound of the low anterior neck in approximately the midline. A tracheostomy was performed by extending the latter wound. At this point bloody air was noted bubbling from the wound and an injury to the right lateral wall of the trachea was observed. Incisions were made in the upper anterior chest wall bilaterally to combat possible subcutaneous emphysema. Intravenous infusions of blood and saline were begun and oxygen was administered. Despite these measures cardiac arrest occurred and closed chest cardiac massage failed to re-establish cardiac action. The President was pronounced dead approximately thirty to forty minutes after receiving his wounds.

The remains were transported via the Presidential plane to Washington, D.C. and subsequently to the Naval Medical School, National Naval Medical Center, Bethesda, Maryland for postmortem examination.

GENERAL DESCRIPTION OF BODY: The body is that of a muscular, well-developed and well nourished adult Caucasian male measuring 72½ inches and weighing approximately 170 pounds. There is beginning rigor mortis, minimal dependent livor mortis of the dorsum, and early algor mortis. The hair is reddish brown and abundant, the eyes are blue, the right pupil measuring 8 mm. in diameter, the left 4 mm. There is edema and ecchymosis of the inner canthus region of the left eyelid measuring approximately 1.5 cm. in greatest diameter. There is edema and ecchymosis diffusely over the right supra-orbital ridge with abnormal mobility of the underlying bone. (The remainder of the scalp will be described with the skull.)

COMMISSION EXHIBIT 387—Continued

There is clotted blood on the external ears but otherwise the ears, nares, and mouth are essentially unremarkable. The teeth are in excellent repair and there is some pallor of the oral mucous membrane.

Situated on the upper right posterior thorax just above the upper border of the scapula there is a 7 x 4 millimeter oval wound. This wound is measured to be 14 cm. from the tip of the right acromion process and 14 cm. below the tip of the right mastoid process.

Situated in the low anterior neck at approximately the level of the third and fourth tracheal rings is a 6.5 cm. long transverse wound with widely gaping irregular edges. (The depth and character of these wounds wil be further described below.)

Situated on the anterior chest wall in the nipple line are bilateral 2 cm. long recent transverse surgical incisions into the subcutaneous tissue. The one on the left is situated 11 cm. cephalad to the nipple and the one on the right 8 cm. cephalad to the nipple. There is no hemorrhage or ecchymosis associated with these wounds. A similar clean wound measuring 2 cm. in length is situated on the antero-lateral aspect of the left mid arm. Situated on the antero-lateral aspect of each ankle is a recent 2 cm. transverse incision into the subcutaneous tissue.

There is an old well healed 8 cm. McBurney abdominal incision. Over the lumbar spine in the midline is an old, well healed 15 cm. scar. Situated on the upper antero-lateral aspect of the right thigh is an old, well healed 8 cm. scar.

MISSILE WOUNDS:

1. There is a large irregular defect of the scalp and skull on the right involving chiefly the parietal bone but extending somewhat into the temporal and occipital regions. In this region there is an actual absence of scalp and bone producing a defect which measures approximately 13 cm. in greatest diameter.

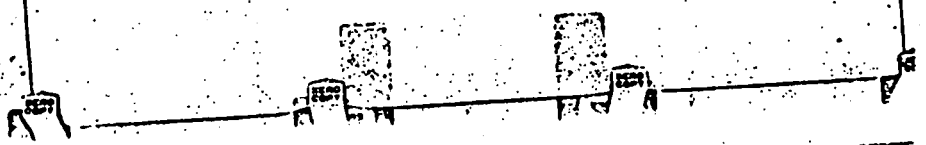
From the irregular margins of the above scalp defect tears extend in stellate fashion into the more or less intact scalp as follows:

a. From the right inferior temporo-parietal margin anterior to the right ear to a point slightly above the tragus.

b. From the anterior parietal margin anteriorly on the forehead to approximately 4 cm. above the right orbital ridge.

c. From the left margin of the main defect across the midline antero-laterally for a distance of approximately 8 cm.

d. From the same starting point as c. 10 cm. postero-laterally.



COMMISSION EXHIBIT 387—Continued

Situated in the posterior scalp approximately 2.5 cm. laterally to the right and slightly above the external occipital protuberance is a lacerated wound measuring 15 x 6 mm. In the underlying bone is a corresponding wound through the skull which exhibits beveling of the margins of the bone when viewed from the inner aspect of the skull.

Clearly visible in the above described large skull defect and exuding from it is lacerated brain tissue which on close inspection proves to represent the major portion of the right cerebral hemisphere. At this point it is noted that the falx cerebri is extensively lacerated with disruption of the superior saggital sinus.

Upon reflecting the scalp multiple complete fracture lines are seen to radiate from both the large defect at the vertex and the smaller wound at the occiput. These vary greatly in length and direction, the longest measuring approximately 19 cm. These result in the production of numerous fragments which vary in size from a few millimeters to 10 cm. in greatest diameter.

The complexity of these fractures and the fragments thus produced tax satisfactory verbal description and are better appreciated in photographs and roentgenograms which are prepared.

The brain is removed and preserved for further study following formalin fixation.

Received as separate specimens from Dallas, Texas are three fragments of skull bone which in aggregate roughly approximate the dimensions of the large defect described above. At one angle of the largest of these fragments is a portion of the perimeter of a roughly circular wound presumably of exit which exhibits beveling of the outer aspect of the bone and is estimated to measure approximately 2.5 to 3.0 cm. in diameter. Roentgenograms of this fragment reveal minute particles of metal in the bone at this margin. Roentgenograms of the skull reveal multiple minute metallic fragments along a line corresponding with a line joining the above described small occipital wound and the right supra-orbital ridge. From the surface of the disrupted right cerebral cortex two small irregularly shaped fragments of metal are recovered. These measure 7 x 2 mm. and 3 x 1 mm. These are placed in the custody of Agents Francis X. O'Neill, Jr. and James W. Sibert, of the Federal Bureau of Investigation, who executed a receipt therefor (attached).

2. The second wound presumably of entry is that described above in the upper right posterior thorax. Beneath the skin there is ecchymosis of subcutaneous tissue and musculature. The missile path through the fascia and musculature cannot be easily proved. The wound presumably of exit was that described by Dr. Malcolm Perry of Dallas in the low anterior cervical region. When observed by Dr. Perry the wound measured "a few millimeters in diameter", however it was extended as a tracheostomy incision and thus its character is distorted at the time of autopsy. However, there is considerable ecchymosis of the strap muscles of the right side of the neck and of the fascia about the trachea adjacent to the line of the tracheostomy wound. The third point of reference in connecting

COMMISSION EXHIBIT 387—Continued

PATHOLOGICAL EXAMINATION REPORT A63-272

these two wounds is in the apex (supra-clavicular portion) of the right pleural cavity. In this region there is contusion of the parietal pleura and of the extreme apical portion of the right upper lobe of the lung. In both instances the diameter of contusion and ecchymosis at the point of maximal involvement measures 5 cm. Both the visceral and parietal pleura are intact overlying these areas of trauma.

INCISIONS: The scalp wounds are extended in the coronal plane to examine the cranial content and the customary (Y) shaped incision is used to examine the body cavities.

THORACIC CAVITY: The bony cage is unremarkable. The thoracic organs are in their normal positions and relationships and there is no increase in free pleural fluid. The above described area of contusion in the apical portion of the right pleural cavity is noted.

LUNGS: The lungs are of essentially similar appearance the right weighing 320 Gm., the left 290 Gm. The lungs are well aerated with smooth glistening pleural surfaces and grey-pink color. A 5 cm. diameter area of purplish red discoloration and increased firmness to palpation is situated in the apical portion of the right upper lobe. This corresponds to the similar area described in the overlying parietal pleura. Incision in this region reveals recent hemorrhage into pulmonary parenchyma.

HEART: The pericardial cavity is smooth walled and contains approximately 10 cc. of straw-colored fluid. The heart is of essentially normal external contour and weighs 350 Gm. The pulmonary artery is opened in situ and no abnormalities are noted. The cardiac chambers contain moderate amounts of postmortem clotted blood. There are no gross abnormalities of the leaflets of any of the cardiac valves. The following are the circumferences of the cardiac valves: aortic 7.5 cm., pulmonic 7 cm., tricuspid 12 cm., mitral 11 cm. The myocardium is firm and reddish brown. The left ventricular myocardium averages 1.2 cm. in thickness, the right ventricular myocardium 0.4 cm. The coronary arteries are dissected and are of normal distribution and smooth walled and elastic throughout.

ABDOMINAL CAVITY: The abdominal organs are in their normal positions and relationships and there is no increase in free peritoneal fluid. The vermiform appendix is surgically absent and there are a few adhesions joining the region of the cecum to the ventral abdominal wall at the above described old abdominal incisional scar.

SKELETAL SYSTEM: Aside from the above described skull wounds there are no significant gross skeletal abnormalities.

PHOTOGRAPHY: Black and white and color photographs depicting significant findings are exposed but not developed. These photographs were placed in the custody of Agent Roy H. Kellerman of the U. S. Secret Service, who executed a receipt therefore (attached).

COMMISSION EXHIBIT 387—Continued

ROENTGENOGRAMS: Roentgenograms are made of the entire body and of the separately submitted three fragments of skull bone. These are developed and were placed in the custody of Agent Roy H. Kellerman of the U. S. Secret Service, who executed a receipt therefor (attached).

SUMMARY: Based on the above observations it is our opinion that the deceased died as a result of two perforating gunshot wounds inflicted by high velocity projectiles fired by a person or persons unknown. The projectiles were fired from a point behind and somewhat above the level of the deceased. The observations and available information do not permit a satisfactory estimate as to the sequence of the two wounds.

The fatal missile entered the skull above and to the right of the external occipital protuberance. A portion of the projectile traversed the cranial cavity in a posterior-anterior direction (see lateral skull roentgenograms) depositing minute particles along its path. A portion of the projectile made its exit through the parietal bone on the right carrying with it portions of cerebrum, skull and scalp. The two wounds of the skull combined with the force of the missile produced extensive fragmentation of the skull, laceration of the superior saggital sinus, and of the right cerebral hemisphere.

The other missile entered the right superior posterior thorax above the scapula and traversed the soft tissues of the supra-scapular and the supra-clavicular portions of the base of the right side of the neck. This missile produced contusions of the right apical parietal pleura and of the apical portion of the right upper lobe of the lung. The missile contused the strap muscles of the right side of the neck, damaged the trachea and made its exit through the anterior surface of the neck. As far as can be ascertained this missile struck no bony structures in its path through the body.

In addition, it is our opinion that the wound of the skull produced such extensive damage to the brain as to preclude the possibility of the deceased surviving this injury.

A supplementary report will be submitted following more detailed examination of the brain and of microscopic sections. However, it is not anticipated that these examinations will materially alter the findings.

J. J. HUMES
CDR, MC, USN (497831)

J. THORNTON BOSWELL
CDR, MC, USN (489878)

PIERRE A. FINCK
LT COL, MC, USA
(04-043-322)

COMMISSION EXHIBIT 387—Continued

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Commission Exhibit No. 391

1/6/63

SUPPLEMENTARY REPORT OF AUTOPSY NUMBER A63-272
PRESIDENT JOHN F. KENNEDY

PATHOLOGICAL EXAMINATION REPORT No. A63-272 Page 1

GROSS DESCRIPTION OF BRAIN: Following formalin fixation the brain weighs 1500 gms. The right cerebral hemisphere is found to be markedly disrupted. There is a longitudinal laceration of the right hemisphere which is para-sagittal in position approximately 2.5 cm. to the right of the of the midline which extends from the tip of the occipital lobe posteriorly to the tip of the frontal lobe anteriorly. The base of the laceration is situated approximately 4.5 cm. below the vertex in the white matter. There is considerable loss of cortical substance above the base of the laceration, particularly in the parietal lobe. The margins of this laceration are at all points jagged and irregular, with additional lacerations extending in varying directions and for varying distances from the main laceration. In addition, there is a laceration of the corpus callosum extending from the genu to the tail. Exposed in this latter laceration are the interiors of the right lateral and third ventricles.

When viewed from the vertex the left cerebral hemisphere is intact. There is marked engorgement of meningeal blood vessels of the left temporal and frontal regions with considerable associated sub-arachnoid hemorrhage. The gyri and sulci over the left hemisphere are of essentially normal size and distribution. Those on the right are too fragmented and distorted for satisfactory description.

When viewed from the basilar aspect the disruption of the right cortex is again obvious. There is a longitudinal laceration of the mid-brain through the floor of the third ventricle just behind the optic chiasm and the mammillary bodies. T his laceration partially communicates with an oblique 1.5 cm. tear through the left cerebral peduncle. There are irregular superficial lacerations over the basilar aspects of the left temporal and frontal lobes.

In the interest of preserving the specimen coronal sections are not made. The following sections are taken for microscopic examination:

a. From the margin of the laceration in the right parietal lobe.

b. From the margin of the laceration in the corpus callosum.

c. From the anterior portion of the laceration in the right frontal lobe.

d. From the contused left fronto-parietal cortex.

e. From the line of transection of the spinal cord.

f. From the right cerebellar cortex.

g. From the superficial laceration of the basilar aspect of the left temporal lobe.

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COMMISSION EXHIBIT 391

Commission Exhibit No. 391

MEB

PATHOLOGICAL EXAMINATION REPORT No. A63-272 Page 2

During the course of this examination seven (7) black and white and six (6) color 4x5 inch negatives are exposed but not developed (the cassettes containing these negatives have been delivered by hand to Rear Admiral George W. Burkley, MC, USN, White House Physician).

MICROSCOPIC EXAMINATION:

BRAIN: Multiple sections from representative areas as noted above are examined. All sections are essentially similar and show extensive disruption of brain tissue with associated hemorrhage. In none of the sections examined are there significant abnormalities other than those directly related to the recent trauma.

HEART: Sections show a moderate amount of subepicardial fat. The coronary arteries, myocardial fibers, and endocardium are unremarkable.

LUNGS: Sections through the grossly described area of contusion in the right upper lobe exhibit disruption of alveolar walls and recent hemorrhage into alveoli. Sections are otherwise essentially unremarkable.

LIVER: Sections show the normal hepatic architecture to be well preserved. The parenchymal cells exhibit markedly granular cytoplasm indicating high glycogen content which is characteristic of the "liver biopsy pattern" of sudden death.

SPLEEN: Sections show no significant abnormalities.

KIDNEYS: Sections show no significant abnormalities aside from dilatation and engorgement of blood vessels of all calibers.

SKIN WOUNDS: Sections through the wounds in the occipital and upper right posterior thoracic regions are essentially similar. In each there is loss of continuity of the epidermis with coagulation necrosis of the tissues at the wound margins. The scalp wound exhibits several small fragments of bone at its margins in the subcutaneous tissue.

FINAL SUMMARY: This supplementary report covers in more detail the extensive degree of cerebral trauma in this case. However neither this portion of the examination nor the microscopic examinations alter the previously submitted report or add significant details to the cause of death.

J. J. HUMES
CDR, MC, USN, 497831

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COMMISSION EXHIBIT 391—Continued

Commission Exhibit No. 391

1221

6 December 1963

From: Commanding Officer, U. S. Naval Medical School
To: The White House Physician
Via: Commanding Officer, National Naval Medical Center

Subj: Supplementary report of Naval Medical School autopsy No. A63-272, John F. Kennedy; forwarding of

1. All copies of the above subject final supplementary report are forwarded herewith.

J. H. STOVER, JR.

6 December 1963

FIRST ENDORSEMENT

From: Commanding Officer, National Naval Medical Center
To: The White House Physician

1. Forwarded.

C. B. CALLOWAY

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COMMISSION EXHIBIT 391—Continued

Volume XVII

Exhibit	Number
Bullet that fell from stretcher of Texas Governor Connally	399
Scheme illustrating a perforating missile wound of the skull	400

INVESTIGATION OF
THE ASSASSINATION OF PRESIDENT JOHN F. KENNEDY

HEARINGS

Before the President's Commission on the Assassination of President Kennedy

PURSUANT TO EXECUTIVE ORDER 11130, an Executive order creating a Commission to ascertain, evaluate, and report upon the facts relating to the assassination of the late President John F. Kennedy and the subsequent violent death of the man charged with the assassination and S.J. RES. 137, 88TH CONGRESS, a concurrent resolution conferring upon the Commission the power to administer oaths and affirmations, examine witnesses, receive evidence, and issue subpenas

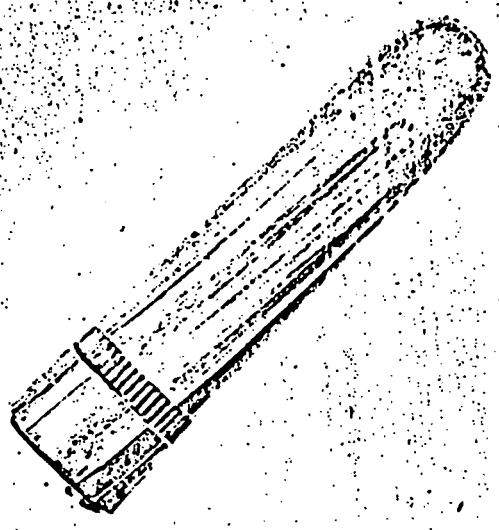
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XVII

UNITED STATES GOVERNMENT PRINTING OFFICE
WASHINGTON, D.C.

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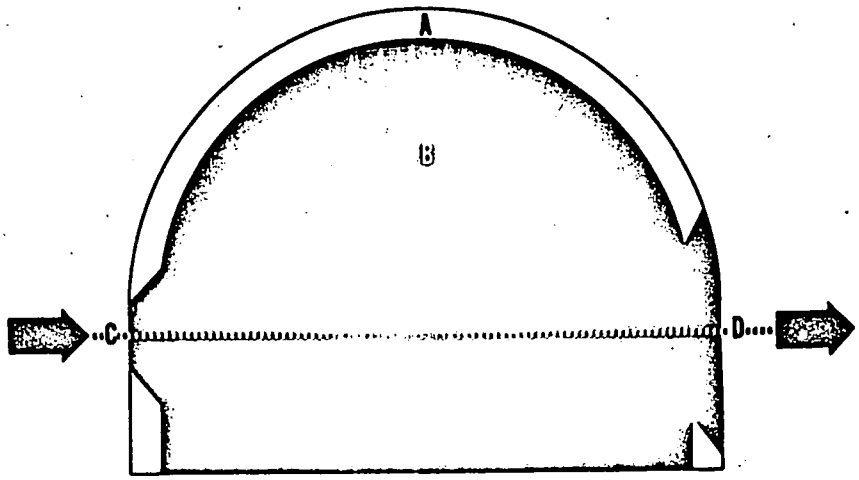


COMMISSION EXHIBIT 399

Bullet found in Dallas, Texas.

Fell from the stretcher of Texas Governor Connally.

PERFORATING MISSILE WOUND OF THE SKULL



A = Cranial vault. B = Cranial cavity. C = Entrance. D = Exit.

Arrows indicate missile path.
Entrance is often smaller than exit because of bullet "mushrooming" or tumbling and/or secondary missile
Note "coning," "cratering," or "beveling" of the bone.
The diameter of the hole is smaller on the impact side. (The same differences of diameter apply to a glass pa

(Scheme by Scientific Illustration Division, AFIP,
from data provided by Lt Col Pierre A. Finck, MC, USA. AFIP Neg. 63-4825.)

COMMISSION EXHIBIT 400